1969

University of Maine Catalog for 1970

University of Maine

UNIVERSITY OF MAINE

Catalog for 1970

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BULLETIN
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ABBREVIATIONS AND SYMBOLS

ARE	Agricultural and Resource Economics
AE	Agricultural Engineering
AnV	Animal and Veterinary Sciences
As	Astronomy
At	Art
Ay	Anthropology
Ba	Business Administration
Bc	Biochemistry
Bt	Botany
By	Bacteriology
Cd	Clothing and Design
Ce	Civil Engineering
Cf	Child Development and Family Relationships
Ch	Chemistry
ChE	Chemical Engineering
Cl	Classics
Cp	Comparative Literature
Ec	Economics
Ed	Education
Ee	Electrical Engineering
Eh	English
En	Entomology
Fn	Food and Nutrition
Fo	Folklore
Fr	French
Fs	Food Science
Fy	Forest Resources
Ge	General Engineering
Gk	Greek
Gm	German
Gy	Geological Sciences
He	Home Economics Education
Hm	Home Management and Housing
Hr	Honors
Hy	History
IS	Independent Study
It	Italian
Jr	Journalism
LSA	General Life Sciences and Agriculture
Lt	Latin
Ly	Library Service
Mc	Music
Me	Mechanical Engineering
Mhe	Man and his Environment
Ms	Mathematics
Mt	Military
My	Modern Society
Nu	Nursing
P	Plants
Pa	Pulp and Paper Technology
Pe	Physical Education
Pl	Philosophy
Ps	Physics
Pol	Political Science
Py	Psychology
Ru	Russian
S	Soils
Sh	Speech
SS	Special Seminar
Sp	Spanish
Sw	Social Work
Sy	Sociology
Zo	Zoology

† Courses offered during 1970-71 and alternate years.
‡ Courses offered during 1969-70 and alternate years.

INFORMATION IN THIS CATALOG COVERS 1969-70 ACADEMIC YEAR

The information contained in this catalog covers rules, regulations, curricula, and programs for the 1969-70 academic year. The University reserves the right to make changes at any time.

CONTENTS

APPROVED CALENDAR FOR 1969-70
ORONO AND PORTLAND CAMPUSES
Fall 1969

		1969	
Registration of all students who have not previously completed it by mail	Sat. 8:00 A.M.-12:00 M 1:00 P.M.- 4:30	Sept.	13
Classes begin	Mon., 8:00 A.M.	Sept.	15
Midsemester reports due (covering the first half semester to November 7)	Mon., 12:00 M	Nov.	10
Thanksgiving recess begins	Tues., 5:00 P.M.	Nov.	25
Classes resume	Mon., 8:00 A.M.	Dec.	1
Associate and baccalaureate degree requests for January commencement due in Registrar's Office	Mon., noon	Dec.	15
Christmas recess begins	Fri., 5:00 P.M.	Dec.	19
	1970		
Classes resume	Mon., 8:00 A.M.	Jan.	5
Graduate theses due	Fri., 4:30 P.M.	Jan.	9
Classes end	Wed., 5:00 P.M.	Jan.	14
Reading period	Thursday	Jan.	15
Final examinations begin	Fri., 8:00 A.M.	Jan.	16
Registration for spring semester	Mon.-Sat.	Jan.	19-24
Final examinations end	Saturday	Jan.	24
Commencement exercises	Sat., 7:45 P.M.	Jan.	24
Midyear recess begins	Sat., 6:30 P.M.	Jan.	24
Registration of all students who have not previously completed it	Sat., 8:00 A.M.-11 A.M.	Jan.	31

Spring 1970

		1970	
Classes begin	Mon., 8:00 A.M.	Feb.	2
Midsemester reports due (covering the first half semester to March 25)	Thurs., 12:00 M	Mar.	26
Spring recess begins	Fri., 5:00 P.M.	Mar.	27
Classes resume	Mon., 8:00 A.M.	Apr.	6
Associate and baccalaureate degree requests for June commencement due in Registrar's Office	Wed., noon	Apr.	15
Maine Day	Wednesday	May	6
Graduate theses due	Fri., 4:30 P.M.	May	15
Classes end	Fri., 5:00 P.M.	May	22
Reading period	Monday	May	25
Final examinations begin	Tues., 8:00 A.M.	May	26
Final examinations end	Wednesday	June	3
Class Day	Thursday	June	4
Commencement exercises	Friday	June	5

Summer Camp

Forestry	Start—Mon., June 8	End—Sat., Aug. 1

Summer Sessions

Three week sessions	Start—Mon., June 15	End—Fri., July 3
	Mon., July 6	Fri., July 24
	Mon., July 27	Fri., Aug. 14
	Mon., Aug. 17	Fri., Sept. 4
Six week sessions	Start—Mon., June 15	End—Fri., July 24
	Mon., July 6	Fri., Aug. 14
	Mon., July 27	Fri., Sept. 4
Associate and baccalaureate degree requests for August commencement due in Registrar's Office	Wed., noon	July 15
Graduate theses due	Fri., 4:30 P.M.	Aug. 7
Commencement exercises	Fri., 7:45 P.M.	Aug. 14

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BOARD OF TRUSTEES

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HAYDEN L. V. ANDERSON Term expires May 26, 1969	Pond Road, Gardiner 04345
ARTHUR HENRI BENOIT Term expires May 26, 1974	Monument Square, Portland 04111
HERBERT R. BROWN Term expires May 26, 1972	32 College Street, Brunswick 04011
LUCIA M. CORMIER Term expires May 26, 1970	312 Fore Street, Portland 04111
VAUGHN CURRIER Term expires May 26, 1973	School Street, Fort Kent 04743
RALPH H. CUTTING Term expires May 26, 1971	Keyes Fibre Company, Waterville 04901
ROBERT NELSON HASKELL Term expires May 26, 1972	33 State Street, Bangor 04401
STEPHEN THOMAS HUGHES Term expires May 26, 1976	Box 141A, West Auburn Road, Auburn 04210
WILLIAM T. LOGAN, JR. *ex officio*	State House, Augusta 04330
JAMES H. PAGE Term expires May 26, 1974	57 Sweden Street, Caribou 04736
W. GORDON ROBERTSON Term expires May 26, 1973	84 Harlow Street, Bangor 04401
SIDNEY W. WERNICK Term expires May 26, 1970	85 Exchange Street, Portland 04111
NILS Y. WESSELL Term expires May 26, 1971	630 5th Avenue, Room 2550, New York, N. Y. 10020

CLERK OF THE BOARD: Edith G. Wilson

OFFICERS OF ADMINISTRATION*

OFFICERS OF THE UNIVERSITY

CHANCELLOR. Donald R. McNeil.

PRESIDENT. Winthrop Charles Libby, Alumni Hall.

VICE PRESIDENT FOR ACADEMIC AFFAIRS. James Milford Clark, Alumni Hall.

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DIRECTOR OF PHYSICAL PLANT. Francis Stephen McGuire, 113 Service Building.

DIRECTOR OF PUBLIC INFORMATION AND CENTRAL SERVICES. Howard Arthur Keyo, PICS Building.

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DIRECTOR OF RESIDENCE AND DINING HALLS. William Carl Wells, West Commons.

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* A complete list of teaching personnel is given in the back of this catalog.

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College of Arts and Sciences. John Jacob Nolde, Dean, 100 Stevens Hall.

College of Business Administration. William Stanley Devino, Dean, Stevens Hall, South.

College of Education. Mark Richard Shibles, Dean, 151 College of Education Building.

College of Life Sciences and Agriculture. Bruce Robert Poulton, Dean, 16 Winslow Hall.

School of Forest Resources. Albert Deane Nutting, Director, Forest Resources Building.

School of Home Economics. Margaret Elizabeth Thornbury, Director, 24 Merrill Hall.

College of Technology. Eldred Wilson Hough, Dean, 110 Boardman Hall.

Technical Institute Division. Robert Barlow Rhoads, Associate Director, 208 Boardman Hall.

Graduate School. Franklin Paul Eggert, Winslow Hall.

School of Law. Edward Settle Godfrey, Dean, 68 High Street, Portland.

Summer Session. Mark Richard Shibles, Director, 151 College of Education Building.

Continuing Education Division. John Mortimer Blake, Director, Merrill Hall.

Public Services Division and Cooperative Extension Service. Edwin Hill Bates, Director, 14 Winslow Hall.

Maine Agricultural Experiment Station. Bruce Robert Poulton, Director, 16 Winslow Hall.

Maine Technology Experiment Station. Horace Asa Pratt, Testing Engineer, 106 Boardman Hall.

Department of Industrial Cooperation. Richard Conrad Hill, Director, 110 Boardman Hall.

OFFICERS OF THE DEPARTMENTS

Agricultural Engineering. Professor Norman Smith, 2 Agricultural Engineering Building.

Agricultural and Resource Economics. Professor Homer Bastian Metzger, 36 Winslow Hall.

Animal and Veterinary Sciences. Professor Stanley D. Musgrave, Hitchner Hall.

Anthropology. Professor Richard Gibbs Emerick, 52 South Stevens.

UNIVERSITY OF MAINE

ART. Professor Vincent Andrew Hartgen, Carnegie Hall, (on leave of absence, 1969-70), Assistant Professor David Owen Decker, Acting Chairman, 1969-70, Carnegie Hall.

BACTERIOLOGY. Professor Darrell Bradford Pratt, Hitchner Hall.

BIOCHEMISTRY. Professor Frederick Herbert Radke, 231 Hitchner Hall.

BOTANY AND PLANT PATHOLOGY. Associate Professor Gary Allen McIntyre, 315 Deering Hall.

CHEMICAL ENGINEERING. Professor Edward George Bobalek, 275 Aubert Hall.

CHEMISTRY. Professor James Langdon Wolfhagen, 261 Aubert Hall.

CIVIL ENGINEERING. Associate Professor Wayne A. Hamilton, 101 Boardman Hall.

ECONOMICS. Professor John Donald Coupe, (Acting Chairman).

ELECTRICAL ENGINEERING. Professor Richard Cushing Gibson, 101 Barrows Hall.

ENGLISH. Professor Robert Hunting, Stevens Hall.

ENTOMOLOGY. Professor Geddes Wilson Simpson, 306 Deering Hall.

FOOD SCIENCE. Professor John Matthew Hogan, 102B Holmes Hall.

FOREIGN LANGUAGES AND CLASSICS. Professor George Tufford Moody, 201A Little Hall.

FOREST RESOURCES. Director Albert Nutting, Forest Resources Building.

GEOLOGICAL SCIENCES. Professor Philip Henry Osberg, 138 Boardman Hall.

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HISTORY. Professor Robert Seager, II, 170 Stevens Hall, (on leave of absence, 1969-70) Professor David White Trafford, (Acting Chairman 1969-70). 170 Stevens Hall.

HOME ECONOMICS. Director Margaret Elizabeth Thornbury, 24 Merrill Hall.

INDUSTRIAL COOPERATION. Professor Richard Conrad Hill, 112 Boardman Hall.

JOURNALISM. Professor Brooks Witham Hamilton, 101A Lord Hall.

MATHEMATICS AND ASTRONOMY. Professor John Carl Mairhuber, College of Education Building.

MECHANICAL ENGINEERING. Professor Francis Joseph Sullivan, 209 Boardman Hall.

MILITARY SCIENCE. Lt. Col. George Fell, Armory.

MUSIC. Professor Robert Chandler Godwin, Lord Hall.

PHILOSOPHY. Associate Professor Robert Fertig Tredwell, 11 Stevens Hall, North.

PHYSICAL EDUCATION AND ATHLETICS. Professor Harold Scott Westerman, Memorial Gymnasium.

PHYSICS. Professor Paul Rice Camp, Clarence E. Bennett Hall.

PLANT AND SOIL SCIENCES. Professor Roland August Struchtemeyer, 114 Deering Hall.

POLITICAL SCIENCE. Professor Eugene Alberto Mawhinney, 11 Stevens Hall, North.

PSYCHOLOGY. Professor Stanley Stewart Pliskoff, 301A Little Hall.

SOCIOLOGY. Professor William Sezak, (Acting Chairman), Stevens Hall, South.

SPEECH. Professor Wofford Gordon Gardner, 310 Stevens Hall.

ZOOLOGY. Professor Kenneth William Allen, Joseph Magee Murray Hall.

OFFICERS OF ADMINISTRATION

Portland Campus

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DEAN OF INSTRUCTION. John Winfield Sweigart, Jr.

ASSOCIATE DEAN. William Lawrence Whiting.

BURSAR. Harold Merrill Lawrence.

LIBRARIAN. Marjorie Ann Duval.

REGISTRAR. Rebecca Chester Larsen.

DIRECTOR OF ADMISSIONS. Alfred Evans Clarke.

DIRECTOR OF CONTINUING EDUCATION DIVISION CENTER. Walter Peter Fridinger.

DIRECTOR OF PUBLIC INFORMATION AND CENTRAL SERVICES. Bryant Paul Jones.

DIRECTOR OF STUDENT AFFAIRS. Dorothy Gillette Dissell.

DIRECTOR OF STUDENT AID, PLACEMENT AND SUMMER SESSION. Frederick Edward Freise.

DIRECTOR OF STUDENT UNION. George Edward Van Amburg.

DIRECTOR OF TESTING AND COUNSELING. Jane Oberholtzer Sanborn.

CHAIRMEN OF THE ACADEMIC DIVISIONS

Portand Campus

DIVISION OF BUSINESS AND ECONOMICS. Associate Professor John William Bay, Bonney Hall.

DIVISION OF HUMANITIES. Professor William John MacLeod, Bonney Hall.

DIVISION OF SCIENCE AND MATHEMATICS. Professor Haig Hagop Najarian, Payson Smith Hall.

DIVISION OF SOCIAL SCIENCES. Associate Professor Phillip Albert Cole, Bonney Hall.

SCHOOL OF NURSING. Associate Professor Mary Ann Eells.

OFFICERS OF THE ADMINISTRATION

Augusta Campus

DIRECTOR. Lloyd Jay Jewett.

DIRECTOR OF CONTINUING EDUCATION DIVISION CENTER. John Rosaire Benoit.

DIRECTOR OF ADMINISTRATIVE SERVICES. Clifford H. West.

CORRESPONDENCE

Inquiries should be directed as indicated below:

General administrative matters.....President, Winthrop C. Libby

Scholarship records.....Registrar, George H. Crosby

UNIVERSITY OF MAINE

Admission to the freshman class and to advanced standing (Orono) ..... Director of Admissions, James A. Harmon
University of Maine in Portland ... Director of Admissions, Alfred E. Clarke

Financial affairs of students ..... Business Manager, Alden E. Stuart.

College of Arts and Sciences ..... Dean of the College, John J. Nolde

College of Business Administration ..... Dean of the College, William S. Devino

College of Education ..... Dean of the College, Mark R. Shibles

College of Life Sciences and Agriculture ... Dean of the College, Bruce R. Poulton

College of Technology ..... Dean of the College, Eldred W. Hough

University of Maine in Portland:
Undergraduate Studies, David R. Fink, Jr., Provost, 96 Falmouth Street

University of Maine in Augusta:
Director, Lloyd Jewett, 99 Western Avenue

Graduate School and Scholarships available for graduate students ..... Dean of Graduate School, Franklin P. Eggert

Summer Session for teachers and college students ..... Director, Mark R. Shibles

School of Law, Edward S. Godfrey, Dean, 68 High Street, Portland

Continuing Education Courses ..... Center Directors

Edward W. Hackett, Jr.
University of Maine
14 Merrill Hall, Orono

Walter P. Fridinger
University of Maine, Portland
96 Falmouth St., Portland

John R. Benoit
University of Maine, Augusta
99 Western Avenue, Augusta

Arnold G. Westerberg
University of Maine, Lewiston-Auburn
Room 405A, 145 Lisbon Street, Lewiston

William U. Small
Aroostook State College, Presque Isle

Senior and alumni placement ..... Placement Director, Philip J. Brockway

Financial assistance ..... Director of Student Aid, Robert C. Worrick

Dormitory rooms for women ..... Manager, Women's Housing

Dormitory rooms for men, rooms in private house, and apartments ..... Manager, Men's and Family Housing, Vernon C. Elsemore

Foreign students ..... Bryce W. Grindle, Adviser

Conferences and conventions ..... Dwight L. Rideout, Conference Coordinator


AUDITOR

General Information

In 1968 the 103rd Legislature passed and the governor approved legislation creating a system of public higher education for Maine. This action unified the University of Maine and the five state colleges into one "cohesive structure of public higher education in the state of Maine." The University now has campuses in Orono (including the South Campus in Bangor), Portland, Augusta, Presque Isle (Aroostook), Farmington, Fort Kent, Gorham, and Machias (Washington).

The information in this catalog pertains only to the activities and programs at Orono, Portland, and Augusta.

Orono, an attractive town of about 8,000 population, is located about half way between Kittery, the most southerly town in the state, and Fort Kent on the northern boundary. It is on U. S. Route 2A, approximately eight miles from Bangor, the third largest city of the state. The University campus is about a mile from the business section of Orono and borders the Stillwater River, a branch of the Penobscot.

History—The University was established originally as the State College of Agriculture and the Mechanic Arts under the provisions of the Morrill Act, approved by President Lincoln in 1862. The next year the State of Maine accepted

the conditions of the Act and in 1865 created a corporation to administer the affairs of the college. The original name was changed to the University of Maine in 1897.

The institution opened September 21, 1868, with 12 students and two faculty members. Dr. Merritt Caldwell Fernald was appointed acting president. By 1871 curricula had been arranged in agriculture, civil engineering, mechanical engineering, and elective. From these curricula the Colleges of Agriculture, Technology, and Arts and Sciences gradually developed. Women have been admitted since 1872. The School of Education was established in 1930 and became the College of Education in 1958. The University operated a College of Law from 1898 to 1920. After this unit was discontinued in 1920, the University did not offer law courses until 1961 when a School of Law, located in Portland, was added through a merger with Portland University.

By an act of the Maine Legislature, the University of Maine, Portland was established in 1957.

The merger of Portland University and the University of Maine, Orono was approved by the 100th Maine Legislature in 1961.

By an act of the 102nd Maine Legislature, the University of Maine, Augusta was established in 1965.

Schools of Business Administration, Forestry, Home Economics, and Nursing were established in 1958. The School of Business Administration became the College of Business Administration in 1965.

The Maine Agricultural Experiment Station was established as a division of the University by act of the Legislature of 1887, as a result of the passage by Congress of the Hatch Act. It succeeded the Maine Fertilizer Control and Agricultural Experiment Station, which had been established in 1885.

Graduate instruction has been given by various departments for many years. The first master's degree was conferred in 1881 and the first doctor's degree in 1960. Since 1923 graduate work has been a separate division in the charge of a dean.

Beginning in 1895, a Summer Session has usually been held each year. The former six-week program was extended to nine weeks in 1961 and to 12 weeks in 1962. This session is designed for teachers, school administrators, and for college students who desire to accelerate their work.

The institution has been served by the following presidents: The Rev. Charles Frederick Allen, Dr. Merritt Caldwell Fernald, Dr. Abram Winegardner Harris, Dr. George Emory Fellows, Dr. Robert Judson Aley, Dr. Clarence Cook Little, Dr. Harold Sherburne Boardman, Dr. Arthur Andrew Hauck, Dr. Lloyd H. Elliott and Dr. Edwin Young.

Organizations of the University—The University is controlled by a 15-member Board of Trustees. The Board of Trustees has supreme authority in all matters pertaining to the University, and all policies applying to the University as a whole must be approved by the board. Administrative units of the University include the

Colleges of Arts and Sciences, Life Sciences and Agriculture, Business Administration, Education, and Technology; University of Maine, Portland; University of Maine, Augusta; School of Law in Portland; Graduate Study, Summer Session, Cooperative Extension Service, Maine Agricultural Experiment Station, Maine Technology Experiment Station, Continuing Education Division, and Department of Industrial Cooperation. Each division regulates those affairs which concern itself alone.

Policy Statement—The University of Maine fully complies with Title VI of the Civil Rights Act of 1964 and does not discriminate in any way in any of its policies on the basis of race, color, or national origin.

THE COLLEGE OF ARTS AND SCIENCES offers curricula in an approved field of concentration or in any of the following subjects: Anthropology, Art, Chemistry, Comparative Literature, Economics, English, French, Geology, German, Political Science, (option in Public Management.) History, International Affairs, Journalism, Mathematics, Medical Technology, Music, Modern Languages, Nursing, Philosophy, Physics, Psychology, Romance Languages, Sociology, Spanish, Speech, Theatre, and Zoology.

THE COLLEGE OF BUSINESS ADMINISTRATION offers curricula in both Business Administration and Economics. The degree of bachelor of science is awarded to those who successfully complete the requirements in either of these two fields of study.

THE COLLEGE OF EDUCATION offers during the academic year and its Summer Session program professional training for prospective elementary and secondary school teachers, principals, guidance counselors, physical education instructors, and supervisors and teachers of art and music. The degree of bachelor of science in education is given to those who have successfully completed the requirements for the degree.

THE COLLEGE OF LIFE SCIENCES AND AGRICULTURE offers programs leading to the bachelor of science degree in the following fields: Biological Sciences, Agricultural Resource Economics, Agricultural Engineering (jointly with the College of Technology), Agricultural Mechanization, Animal and Veterinary Sciences, Bacteriology, Biochemistry, Biology, Botany, Entomology, Forestry, Home Economics, Plant and Soil Sciences, and Wildlife Management. It also offers two-year preprofessional programs in Agricultural Education, Veterinary Science, Dairy Manufacturing, and Food Processing. Two-year technical training programs leading to a degree of associate in science are offered in Business Management (with options in Food Industry Management and Agricultural Business Management), Animal Technology, Animal Medical Technology, Merchandising and Food Service Management, and Forest Management.

THE COLLEGE OF TECHNOLOGY offers degree programs in Agricultural Engineering (jointly with the College of Life Sciences and Agriculture), Chemical Engineering, Pulp and Paper Technology, Chemistry, Civil Engineering, Electrical Engineering, Engineering Physics and Mechanical Engineering. Post baccalaureate programs leading to a certificate are available in Pulp and Paper Management. Two-year programs are also offered through the Technical Institute Division of

the college in Civil Engineering Technology, Electrical Engineering Technology, Mechanical Engineering Technology, and Chemical Engineering Technology.

THE UNIVERSITY OF MAINE, AUGUSTA provides students the opportunity to complete university requirements for associate degrees in Liberal Studies, General Education, and Administration (Business or Public major) programs. Students receive an Associate in Arts (Liberal Studies and General Education) or an Associate in Science (Administration) degree.

The Liberal Studies program is a University-parallel curriculum and a student may, at any time, transfer to appropriate University of Maine baccalaureate programs. A student must have a 2.8 grade point average to transfer to appropriate baccalaureate degree programs after completing the Administration or General Education program. An evaluation of the academic record will be made at the time of transfer to determine the number of credit hours that may be transferable.

A wide variety of courses at the undergraduate and graduate level is offered in the evening under the direction of the Continuing Education Division. A Masters of Public Administration degree is available through the Continuing Education Division. Also, this division offers many seminars and short-term courses and a varied selection of courses during the summer session.

THE UNIVERSITY OF MAINE, PORTLAND is a full-fledged campus of the University, offering four-year degree programs in a number of areas of concentration, graduate programs in Business Administration, engineering, library science, secondary education, and a more limited variety of graduate courses in other areas of concentration.

Students at the Portland campus may complete University requirements for the degrees of associate in Business Administration, bachelor of science in Business Administration, bachelor of arts with concentration in biology, English, French, history, mathematics, political science, psychology or sociology, bachelor of science in secondary education with concentration in any of the appropriate academic areas previously listed. A four-year program which combines liberal arts and professional nursing is offered by the School of Nursing at the Portland campus. Freshmen intending to concentrate in other areas or continue programs in other colleges of the University may complete at least one year of academic credits at Portland.

THE GRADUATE SCHOOL offers programs of study leading to the degrees of master of arts, master of science, master of engineering, master of arts in teaching (foreign languages), master of education, master of arts in teaching, master of agricultural and resource economics, master of business administration, master of library service, master of mechanical engineering, master of public administration, doctor of philosophy and doctor of education. Programs leading to the Ph.D. degree are available in animal nutrition, chemical engineering, chemistry, civil engineering, history, oceanography, general and experimental psychology, clinical psychology, physics, plant science and zoology. Doctor of education programs are available in guidance and counseling and in the language arts.

The Certificate of Advanced Study, designed for teachers and school administrators, is awarded for the completion of a planned program of 30 hours of work beyond the master's degree.

THE SCHOOL OF LAW, located in Portland, offers a three-year, full-time program of law study leading to the degree of juris doctor. The program is open only to students who already hold a bachelor's degree from an accredited college or university.

THE SUMMER SESSION offers a wide variety of academic and educational courses on both the elementary and secondary level. College students by enrolling in selected subjects can accelerate graduation. For teachers and school administrators there are workshops in elementary and secondary education as well as numerous other courses and conferences especially designed for those engaged in the teaching profession.

THE COOPERATIVE EXTENSION SERVICE is an educational agency representing the University of Maine and the U.S. Department of Agriculture. Educational and informational assistance in a broad range of subjects is provided to individuals, families and organized groups in rural and urban areas of the state.

County Extension Associations are the sponsoring organizations of the Extension program in each county. They function under the leadership of an executive committee with the assistance of local community leaders.

Extension Service personnel include state and area specialists, administrative staff, and Extension agents. The latter, who make up the major part of the staff, are located in each county, usually at the county seat, and carry out work with the assistance of specialists in agriculture, home economics, 4-H and other youth education, resource development, and public affairs education. Extension agents also provide general information about other programs and services of the University of Maine, the U. S. Department of Agriculture and other agencies serving the people of Maine.

THE CONTINUING EDUCATION DIVISION (*C.E.D.*) is a part of the Division of Public Services. It coordinates the part-time study of adults in various locations in Maine and provides programs within commuting distance of their homes. Major C.E.D. centers are maintained at Auburn, Lewiston, Orono, Portland, Presque Isle, and Augusta.

THE MAINE AGRICULTURE EXPERIMENT STATION maintains its offices and principal laboratories at Orono. Experiment farms include Highmoor Farm at Monmouth, Aroostook Farm at Presque Isle, Chapman Farm at Chapman, and Blueberry Hill Farm at Jonesboro.

THE MAINE TECHNOLOGY EXPERIMENT STATION, established in 1915, makes investigations for various state and municipal departments, and on request furnishes scientific information to industries. The station maintains offices and laboratories in Boardman Hall and is under the control of the College of Technology.

THE DEPARTMENT OF INDUSTRIAL COOPERATION is the liaison office between: (1) University departments and (2) outside agencies sponsoring University research work. The department is located in Boardman Hall and is administered by a director who reports to the Coordinator for Research Support and Federal Relations.

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The Office of Research Support and Federal Relations provides assistance to faculty and staff in developing proposals and seeking outside funding for research, instruction, and service projects. The office, with headquarters in Boardman Hall, provides liaison with federal funding agencies.

Buildings—Orono Campus—The following are dormitories and dining facilities:

ANDROSCOGGIN HALL (1963), capacity 248. Named for the county having the sixth largest number of regular full-time students enrolled at the University at the time of its construction.

AROOSTOOK HALL (1963), capacity 179. Named for the county having the fifth largest number of regular full-time students enrolled at the University at the time of its construction.

BALENTINE HALL (1914-1916), capacity 107. Named in honor of the late Elizabeth Abbott Balentine, secretary and registrar of the University, 1894-1913.

CHADBOURNE HALL (1948), capacity 156. Named for Dr. Ava Harriet Chadbourne, professor emerita of education.

COLVIN HALL (1930), capacity 48. Named in honor of the late Caroline Colvin, professor emerita of history and government and the first dean of women at the University. It became a cooperative dormitory for women in 1961.

CORBETT HALL (1947), capacity 228. Named in honor of the late Lamert Seymour Corbett, formerly professor of animal industry and dean of men.

CUMBERLAND HALL (1961), capacity 260. Named for the county having the second largest number of regular full-time students enrolled at the University at the time of its construction.

DUNN HALL (1947), capacity 228. Named in honor of the late Charles John Dunn, formerly Chief Justice of the Supreme Judicial Court of Maine and treasurer of the University from 1909 to 1923.

EAST COMMONS (1963) is a dining hall having a capacity for serving 800 persons cafeteria style. This dining hall serves Androscoggin, Cumberland and Gannett Halls.

ESTABROOKE HALL (1940), capacity 172. Named in honor of the late Kate Clark Estabrooke, a former superintendent of the first women's dormitory, the Mount Vernon House. Its dining hall serves 350 students.

GANNETT HALL (1959), capacity 260. Named in honor of James Adrian Gannett, registrar emeritus.

HANCOCK HALL (1965), capacity 265. Named for the county having the seventh largest number of regular full-time students enrolled at the University at the time of its construction.

HANNIBAL HAMLIN HALL (1911), capacity 89. Named for the late Hon. Hannibal Hamlin of Hampden and Bangor, the first president of the Board of Trustees.

HART HALL (1955), capacity 233. Named in honor of the late James Norris Hart of Orono, dean of the University and professor of mathematics and astronomy.

HILL TOP (1967-68) is a dining hall having the capacity to serve 900 persons cafeteria style. It also contains a small library and reading rooms. The dining hall serves Knox, Oxford and Somerset Halls.

KENNEBEC HALL (1961), capacity 180. Named for the county having the

third largest number of regular full-time students enrolled at the University at the time of its construction.

KNOX HALL (1967), capacity 285. Named for the county having the tenth largest number of full-time students enrolled at the University at the time of its construction.

OAK HALL (1937), capacity 96. Named for the late Hon. Lyndon Oak of Garland, a long-time member and president of the Board of Trustees.

OXFORD HALL (1967), capacity 285. Named for the county having the eighth largest number of full-time students enrolled at the University at the time of its construction.

PENOBSCOT HALL (1960), capacity 180. Named for the county having the largest number of regular full-time students enrolled at the University at the time of its construction.

SOMERSET HALL (1967), capacity 285. Named for the county having the ninth largest number of full-time students enrolled at the University at the time of its construction.

STODDER HALL (1956), capacity 170. Named in honor of the late Mrs. Anne E. Stodder of Bangor, a benefactress of the University. Its dining hall serves 700 students.

THE UNIVERSITY CABINS (1945), capacity 42 men students. These are co-operative units.

UNIVERSITY PARK (1961) is a family housing development that provides apartments for 120 families (24 three-bedroom, 48 two-bedroom and 48 one-bedroom apartments).

WEST COMMONS (1958) is a dining hall having a capacity for serving 1500 persons cafeteria style. This dining hall serves Corbett, Dunn, Hannibal Hamlin, Hancock, Hart and Oak Halls.

YORK HALL (1962), capacity 260. Named for the county having the fourth largest number of regular full-time students enrolled at the University at the time of its construction. Its dining hall serves 700 students.

The following are used mainly for administration and instruction.

AGRICULTURAL ENGINEERING BUILDING (1938) houses the Agricultural Engineering Department and its laboratories for teaching and research.

ALUMNI HALL (1901) contains administrative offices and studios for Educational Television. It received its name because of contributions made by alumni to supply a part of the funds for its erection.

ALUMNI MEMORIAL, consisting of an Indoor Field, Armory, and Gymnasium, was erected as a memorial to the Maine men who died in the service of their country in the Spanish-American War and World War I and is a gift of alumni, students, faculty, and friends of the University. The Indoor Field (1926), one of the largest in the country, provides ample facilities for indoor track, winter baseball practice, and military drill. The Armory (1926) houses offices and classrooms of the military unit, including an indoor rifle range. The Gymnasium (1933) contains the offices of the Department of Physical Education and Athletics, equipment and rooms for handball, boxing, wrestling, and corrective exercise, shower and locker rooms, and an auditorium with a seating capacity of approximately 3,000, used for basketball, lectures, student assemblies, banquets, and dances.

AUBERT HALL (1914) houses the Departments of Chemistry and Chemical Engineering, including the Pulp and Paper Division. It was named in honor

of the late Alfred Bellamy Aubert, professor of chemistry from 1874 to 1909. A wing was added in 1940 to increase the facilities in Chemical Engineering and the Pulp and Paper Division. Two additional wings were added in 1958 to provide more facilities for Chemistry and Chemical Engineering, including the Pulp and Paper Division. The Gottesman Computer and Analysis Laboratory is located in this building.

BARROWS HALL (1963) contains offices, classrooms and laboratories for the Department of Electrical Engineering. It was named for the late William Edward Barrows, formerly professor and head of the Department of Electrical Engineering.

CLARENCE E. BENNETT HALL (1959) contains offices, classrooms, and laboratories of the Department of Physics.

BOARDMAN HALL (1949) houses the Department of Civil Engineering, including Sanitary Engineering, Department of Geology, Department of Mechanical Engineering, Technology Experiment Station laboratories, Department of Industrial Cooperation, office of Research Support and Federal Relations, office of State Technical Services, and office of the Dean of Technology. It was named in honor of President Emeritus Harold Sherburne Boardman.

CARNEGIE HALL, the former library building erected in 1906 through the generosity of Andrew Carnegie, is now devoted to the Department of Art. It was named in honor of the original donor.

COBURN HALL (1888) houses offices of the School of Nursing as well as other miscellaneous offices. It was named for the late Hon. Abner Coburn, a former president of the Board of Trustees and benefactor of the University. Its future role is uncertain.

CROSBY LABORATORY (1928) contains the laboratories of the Department of Mechanical Engineering. It was named for the late Hon. Oliver Crosby, Class of '76, who bequeathed $100,000 for its construction.

DEERING HALL (1949) contains the Departments of Agronomy, Botany, Entomology and Horticulture, also part of the facilities for the Agricultural Experiment Station and the Cooperative Extension Service. It was named in honor of the late Dr. Arthur L. Deering, dean of agriculture, who served the University from 1912-1957.

EAST ANNEX (1947) houses the Department of General Engineering, Student Placement Bureau Personnel Office, Offices of Student Aid, and provides classrooms and offices for the several colleges. The building, formerly a unit of the naval base at Sanford, was erected on the campus by the Bureau of Community Facilities of the Federal Works Agency.

COLLEGE OF EDUCATION BUILDING (1961) contains facilities for the College of Education and, on the top floor, for the Department of Mathematics of the College of Arts and Sciences. The Audio-Visual Service, and laboratories for teacher training, including closed-circuit television, are located in this building.

FERNALD HALL (1870) the oldest building on the campus, contains offices of the personnel deans.

FOGLER LIBRARY (1941-47) was erected and furnished with the aid of a fund-raising campaign by alumni, faculty, students and friends of the University. The completion in 1950 of the main reading room has increased the seating capacity of the library to 570. The library was named in 1962 in honor of Dr. Raymond H. Fogler, a former president of the Board of Trustees.

FORESTRY BUILDING (1968) contains offices, laboratories and classrooms of the School of Forest Resources.

HAUCK AUDITORIUM (1963) was erected and furnished with the aid of a fund-raising campaign by alumni, faculty, students and friends of the University. It contains an auditorium providing seating for 600 persons, stage facilities and the University Store. It was named in honor of Dr. Arthur A. Hauck, president emeritus, who served the University as president from 1934 to 1958.

HITCHNER HALL (1959) contains offices, laboratories, and classrooms for the Departments of Bacteriology, Biochemistry, and Animal and Veterinary Sciences for programs in instruction, research and Extension. It was named for Dr. E. Reeve Hitchner, professor emeritus of bacteriology.

HOLMES HALL (1888) is used by the Maine Agricultural Experiment Station for its administrative offices, and Departments of Chemistry and Food Science. It received its name from the late Dr. Ezekiel Holmes, writer, editor, and pioneer in Maine agriculture.

LENGYEL HALL (1963) contains offices, classrooms and a gymnasium for the Department of Physical Education, women. It was named for Helen Anna Lengyel, professor emerita of women's physical education.

CLARENCE C. LITTLE HALL (1965) houses the Departments of Foreign Languages and Psychology. Contains four general purpose lecture rooms and offices for faculty of College of Arts and Sciences.

LORD HALL (1904) contains offices and laboratories for the Department of Music on the first and second floors of the east wing, and for the Department of Journalism, the Maine Campus newspaper, the Prism (yearbook), and the campus security offices in the west wing. It was named for the late Henry Lord, a former president of the Board of Trustees.

MEMORIAL UNION (1953) is a memorial to the University of Maine men who died, and a tribute to all who served, in World War II. It is the gift of alumni, students, non-alumni faculty, and friends. This union is the center of student activities and recreational programs on the campus. It has a Memorial Room, meeting rooms, lounges, offices, snack bar, game room, bowling alleys, offices for the director of religious affairs and for student organizations, faculty-alumni lounge and dining room which serve the University community. Additional meeting rooms were added in 1961.

MERRILL HALL (1931) is used for work in Home Economics. Also houses offices of Continuing Education Division. It was named for the late Dr. Leon S. Merrill, dean of the College of Agriculture from 1911 to 1933.

MURRAY HALL (1967) is used by the College of Arts and Sciences for its Department of Zoology. It contains offices, seminar rooms, undergraduate and graduate student laboratories.

ROGERS HALL (1928) houses administrative offices of the Department of Animal Sciences and contains research laboratories in animal nutrition and related work. It was named in honor of Dr. Lore A. Rogers, Class of '96, chief of research laboratories (retired), Bureau of Dairy Industry, U.S. Department of Agriculture.

STEVENS HALL (1924), with two wings constructed in 1933, contains accommodations for the Colleges of Arts and Sciences and Business Administration. It was named in honor of the late Dr. James S. Stevens, for many years dean of the College of Arts and Sciences.

WINGATE HALL (1892) contains administrative offices, the office of the Director of Admissions, the office of the Registrar, Data Processing Center, the University Computing Center, and the University Planetarium. It was named for the late William P. Wingate, a former president of the Board of Trustees.

WINSLOW HALL (1909) is used by the College of Life Sciences and Agriculture, the Cooperative Extension Service, and houses the Graduate School office. It was named for the late Edward B. Winslow, a former president of the Board of Trustees.

Other buildings include the President's House, Horticultural Greenhouses, Dairy Barns and Milk House, Federal Office Building, Fisheries Building, Poultry Buildings, Stock Judging Pavilion, Machine Tool Laboratory, Maples, Agricultural Engineering Shop Building, Observatory, Student Health Center, Alumni Center, University Public Information and Press Building, the Central Heating Plant, Service Building, Entomology, several residences occupied by faculty members, and various farm buildings.

University of Maine in Augusta—Please see section on the University of Maine in Augusta for the list of buildings at that campus.

University of Maine in Portland—Please see section on University of Maine in Portland for the list of buildings at that campus.

FRATERNITY HOUSES—The following fraternities have houses on or near the Orono campus: Beta Theta Pi*, Delta Tau Delta, Kappa Sigma, Lambda Chi Alpha, Phi Kappa Sigma, Sigma Chi, Sigma Nu, Theta Chi, Phi Eta Kappa, Alpha Gamma Rho, Alpha Tau Omega*, Phi Gamma Delta, Phi Mu Delta, Tau Epsilon Phi, Tau Kappa Epsilon, Sigma Alpha Epsilon, and Sigma Phi Epsilon.

RESIDENCE AND DINING HALLS—Five complexes of residence and dining halls serve the students. These consist, in general, of a dining hall around which are clustered residence halls for both men and women. At the far south end of campus, York dining hall serves York residence hall (women), Aroostook (men), Kennebec (women), and Estabrooke (graduate students). In south center, Stodder cafeteria serves the Stodder residence hall (men), Balentine (women), Chadbourne (men), and Penobscot (women). In the center of campus, West Commons serves Hart (women), and Corbett (men), Dunn (men), Hancock (women), Hannibal Hamlin (men) and Oak Hall (men). Two complexes are located in the northeast section where East Commons serves Gannett (men), Androscoggin (women), and Cumberland (men), and the newest complex, sometimes called Camelot by the students, is clustered around Hill Top Cafeteria. Here are located Knox (women), Oxford (men), and Somerset (women).

Colvin Hall is the cooperative women's residence where students prepare and serve their own meals and do the general house work in the unit, thus reducing their costs. The University Cabins, with accommodations for four male students each, provide housekeeping facilities.

Residents of the dormitories are furnished meal tickets good for 21 meals per week. Non-residents may buy meals in any dining hall on a transient basis or may purchase a meal ticket.

At the South Campus of the University, women in two-year courses are housed in Belfast Hall and transfer and readmission women live in Augusta Hall. Ellsworth, Rockland, and Lewiston Halls will be occupied by two-year and transfer and read-

mission men. As space becomes available in the Orono residence halls, transfers and readmission students will be reassigned in the order of their dates of admission. Meals for these students are served in Brewer Hall, the dining room in close proximity to the residence halls.

Undergraduate women under 21 not living at home are required to live in one of the women's residence halls. In exceptional circumstances, other arrangements may be made with approval of the Dean of Women.

Freshman male students under 21 who do not live at home are required to live in one of the residence halls, except that the Dean of Men may authorize off-campus residence in exceptional cases.

Students are expected to reside within the system for a complete semester. If they leave, they are subject to a refund policy as set forth in the "Conditions of Occupancy" published each year and given to each student.

Residents of the dormitory system are furnished bed linen each week without extra charge. They furnish their own towels, pillows, blankets, and any decorative features such as rugs, bureau scarfs or drapes.

Temporary housing is furnished as a convenience to students who find it difficult or impossible to leave the campus for the Thanksgiving, mid-year, and spring recesses. No accommodations are available during the Christmas recess.

ATHLETIC FACILITIES—The University's facilities for athletics and physical education on the Orono campus include the Memorial Gymnasium, the Memorial Indoor Field House, the Helen A. Lengyel Gymnasium, numerous athletic fields, and a new natatorium now under construction.

The athletic fields for men include 14 tennis courts, two baseball fields, a football stadium, football practice fields (one of which is illuminated for evening practice), a quarter-mile cinder track, hammer and discus fields, fields for intramural sports, a four-mile cross country course, and skiing facilities.

The Helen A. Lengyel Gymnasium has two large floors which are used by the department for intramural activities in team and individual sports, recreational games, and club activities, as well as for classes. The building includes an indoor archery range, a first aid room, and a remedial gymnasium, which is also used for folk, modern, and square dancing classes.

The women's athletic field is located at the south end of the campus near the women's residences. It has a hockey field, practice area and an archery range and 4 tennis courts. In season, the field is also used for soccer, speedball, and softball.

University Farms—The University farms include approximately 900 acres of land used primarily for a dairy operation. One farm adjoins the campus; others are located in the Stillwater section of Old Town.

The campus farm includes a modern dairy barn housing an outstanding herd of registered dairy cattle representative of the leading breeds. A sizable poultry laying flock, and a flock of sheep are also maintained on the campus farm. A herd of registered beef cattle located off campus is also a part of the total farm operation.

The farms serve several purposes. They are utilized for student instruction, as laboratories for agricultural courses, and as demonstration projects for Extension programs. Research projects are continuously in pogress in various segments of the operation. Milk and eggs produced on the farm are utilized by the University dormitory system.

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University Forest—The University forest, totaling 1,750 acres and located in the Stillwater-Old Town area, is administered by the School of Forestry for student instruction, project demonstration, and research. An additional two acres are operated as a forest nursery. Indian Township, a tract of 17,000 acres, is managed by the School of Forestry for summer instructional purposes. Headquarters for the summer training program is the Robert J. Ashman Forestry Camp on Long Lake, near Princeton.

Woodland Preserve—The Woodland Preserve, consisting of two tracts of woodland and marsh totalling approximately 33 acres in the southeast corner of the Orono campus, was established by action of the Board of Trustees in 1967 to provide the University community with a nearby area for the scientific study and observation of the ecology and natural evolution of forest and marsh.

Computing and Data Processing Services supports the instructional, research, consulting and administrative needs of the university system. A course in digital computer programming is offered by the Department of Mathematics and Astronomy. Business Administration, Chemical Engineering and General Engineering courses teach programming as applied to their disciplines, the latter two including analog work. Non-credit courses and seminars are available to establish competencies necessary to make effective use of computing facilities. Packaged programs are available for most commonly used statistical work and consulting programmers are available to advise on computability.

UNIVERSITY FACILITIES INCLUDE:

IBM 360 in Wingate Hall supplies batch computing. Currently configuration is a model /30 with 64K byte main memory, three 2311 disk drives and a 2415 tape unit (two 9 channel drives). Scheduled to upgrade to 256/40 with additional tapes and disks. Operating system is modified DOS.

IBM 1800 In Aubert Hall. A part of the Gottesman Computation Center, it is particularly well suited to process control work and to support interactive terminals. The facility includes a 16K word memory, two 1810 disk drives and an off-line printer. An EAI PACE 231R analog computer can be operated independently or in hybrid combination with the 1800. Operating system is modified TSX.

IBM 1130 at the University in Portland supplies batch computing. It includes an 8K word main memory and two 2310 disk drives. Operating system is DMS.

IBM 1230 Mark Scoring Machine. A part of the Testing and Counselling Service, this equipment can be used to convert test and questionnaire responses into a media for further analysis on any of the other facilities.

Problems not suited to these equipments are handled on IBM 360/65's operating under modified OS system. Arrangements have been made for 2741 and telephone line service to one and on-site work at another.

The Ira C. Darling Center for Research, Teaching and Service—The Marine Laboratory of the University of Maine. Located on Wentworth Point on the Damariscotta River in Walpole, the Darling Center now has approximately

4,000 square feet of laboratory space available for faculty and graduate marine research. The dormitory accommodates 22. Construction of a pier to receive oceanographic vessels drawing up to 15 feet is scheduled for completion in fall of 1969. A 43-foot schooner, 36-foot research catamaran (also scheduled for completion in fall of 1969), and a number of outboard boats are used for field work. The center's library contains several thousand volumes and an extensive reprint collection. Laboratory space for visiting investigators is available by pre-arrangement. A summer course in marine invertebrate zoology is offered. Courses in biological and geological oceanography are given by Darling Center staff at the Orono campus.

The Libraries—The University Libraries serve the intellectual needs of the students and faculty and stimulate the use of books for research and recreational reading. The libraries contain more than 500,000 volumes and receive some 3,600 periodicals in three divisions. They are the regional depository for northern New England for U.S. Government publications and have a file of maps for the Army Map Service. They also are a selective depository for Canadian government publications. They extend these resources to other libraries through interlibrary loan service, to visiting scholars, and to citizens of the state whenever they can do so without interfering with local needs. Periodical articles and similar materials not available for lending may often be photocopied, subject to copyright regulations.

The University of Maine Art Collection—The University of Maine Art Collection in Carnegie Hall contains materials depicting the history of art through all ages. More than 10,000 photographs, color reproductions, and slides of art masterpieces are available, on occasion, to students and faculty for study and loan. Through generous gifts in recent years the collection has been augmented by some 1,000 original sculptures, paintings, and graphic arts by outstanding American and European artists: Inness, Homer, Hassam, Marin, Hartley, Spinchorn, Kienbusch, Wyeth, Pleissner, Kingman, Peirce, Picasso, Matisse, Rouault, Hamabe and others. Almost all of these works are hung in public areas throughout the campus.

The University of Maine Program of Exhibitions—Throughout the academic year and during the summer session the Department of Art presents each month eight different art exhibitions: four in Carnegie Hall and one each in the Oakes Room of the Fogler Library, the library Photo Salon, the lobby of the Memorial Union Building, and the lobby of Alumni Hall. Special exhibits are arranged from time to time in the East and West Commons lounges, Hauck Auditorium lobby, library reference room, and the Maine Christian Association Building. All exhibits, open without charge, display only original art, with special preference given to professional artists and craftsmen living or working in Maine. As a service to the state each year, the Department of Art arranges and circulates 100 different exhibitions of original art throughout the schools and academies of Maine. There is no charge for these exhibitions, but reservations must be made before Sept. 30 for each academic year. All inquiries should be addressed to Professor Vincent A. Hartgen, Head, Department of Art.

Scientific Collections—The following collections are located on the Orono campus:

BOTANY—The herbarium in Deering Hall includes several collections, the most important of which is the one made by the late Rev. Joseph Blake and presented to the University by Mr. Jonathan G. Clark, of Bangor. The late Professor F.L. Harvey left to the herbarium the general collections accumulated during his connection with the University. Other important collections are Collin's Algae of the Maine Coast, Halsted's Lichens of New England, Halsted's Weeds, Ellis and Everhart's North American Fungi, Cook's Illustrative Fungi, Underwood's Hepaticae, Cummings and Seymour's North American Lichens, and Bartholomew's Fungi Columbiana.

The herbarium has been enriched recently by the personal collections of Mrs. Frank Hinckley, Helen Paine Scoullar, Charles Curtis, Henry Wilson Merrill, Maynard Quimby, Louise Coburn, Sue Gordon, Ralph C. Bean, George B. Rossbach, K.P. Jansson and Glen D. Chamberlain. Numerous centuries of Plantae Exsiccatae Grayanae are significant additions. Sixty-five thousand herbarium sheets are available.

Approximately three acres of land extending southward from the Heating Plant and between the Forest Nursery and the Stillwater River were assigned to the Department of Botany for the establishment of a Botanical Plantation in the autumn of 1934. The first three plantings were made in conjunction with Maine Day of 1935. At present, more than 300 species of trees and shrubs have been introduced. This area was recently named the Fay Hyland Botanical Plantation. Many species of ferns and flowering plants have also been included.

ENTOMOLOGY—A small area partly enclosed by trees of the Botanical Plantation and near the southern boundary of the Forest Nursery forms a site for a small University apiary. This apiary has approximately five colonies that are used for pollination studies.

The Edith M. Patch aphid collection, housed in Deering Hall, is one of the outstanding aphid collections in North America. It is a major portion of the insect collection maintained by the University for reference purposes in dealing with inquiries concerning insect pests sent in by citizens of Maine.

GEOLOGY—The geological collections of minerals, rocks, and fossils are housed in Boardman Hall.

ZOOLOGY—These collections in the new Zoology building, Murray Hall, consist of a working collection of bird skins, a display of bird mounts, and a study collections of various other groups of both vertebrates and invertebrates. The Anson Allen Collection of Invertebrates and of Maine Birds, presented by Mrs. Mattie Munson, and the Eckstorm Collection of birds, presented by Mrs. Fannie H. and Mrs. P. F. Eckstorm, form an important part of the whole.

Planetarium—A Planetarium, operated under the supervision of the Department of Physics, is located in the second floor of Wingate Hall. The Planetarium is used in connection with courses in astronomy but is also open to the public. Groups may visit by making arrangements in advance through the Public Information Office.

The University of Maine Anthropology Museum—The Department of Sociology and Anthropology has established an Anthropology Museum on the

third floor of South Stevens Hall. The museum serves not only as a teaching aid for students in the department but also as an additional cultural facility for the campus and the community. Through the generosity of many interested persons the collection includes material relating to the American Indians, Africa, the Arctic and Oceania. There are also special teaching exhibits on weapon and tool development, fossil man and race, as well as special sections on Maine Indians and Maine prehistory. Loan collections from other institutions sometimes are exhibited. The museum is open to the public whenever the University is open. Regular hours are Monday through Friday, 8 a.m. to 4 p.m. The museum can be opened for groups at other times by appointment. Summer hours are Monday through Friday 9 a.m. to noon.

University Publications—The following are included in the various bulletins and reports regularly issued by the University:

UNIVERSITY OF MAINE BULLETIN is issued about 20 times a year to give information to students, faculty, alumni, and the general public.

UNIVERSITY OF MAINE STUDIES are research works published under the direction of the Faculty of Graduate Study. A price list may be obtained from the Bulletin Room, Public Information Building. Orders and exchanges should be sent to the Bulletin Room.

AGRICULTURE EXPERIMENT STATION PUBLICATIONS include technical and popular bulletins and miscellaneous reports in which are contained the results of research studies; and Official Inspections which contain the results of inspection of feeding stuffs, fertilizers, agricultural seeds, fungicides and insecticides, and foods and drugs. A report of progress is issued quarterly as Research in The Life Sciences. A free copy of each publication is available upon request.

COOPERATIVE EXTENSION SERVICE BULLETINS AND CIRCULARS are issued by the Cooperative Extension Service on a wide variety of subjects relating to agriculture, home economics, youth education, resource development and public affairs. Maine residents may secure a list of available bulletins and circulars upon request to the Mail Room, PICS Building, U of M Orono.

THE MAINE ALUMNUS, an illustrated magazine of campus and alumni news published seven times during the college year, is sent to former students of the University who subscribe, and to those making donations to the Annual Alumni Fund.

THE UNIVERSITY OF MAINE LAW REVIEW is a continuation of the former *Maine Law Review* last published in 1920. It was revived as a student activity in 1962.

Student publications are described in a section of this catalog called "Student Activities."

The Coe Research Fund and The Weppler Fund—The University Trustees have set aside $100,000 to form a permanent fund known as The Coe Research Fund, and $143,000 to form a permanent fund known as the Weppler Fund, the income to be used by the faculty for carrying on research work. From time to time some additional funds are made available to the committee for the same purposes. Applications for grants from these funds should be addressed to the Secretary, Coe Research Fund Committee.

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Faculty Summer Research Grants. A program of support to enable a limited number of grants to underwrite faculty research projects during the summer. Recipients are selected on the basis of information supplied in a proposal which explains the research project to be conducted during the period for which the grant is made. The Coe Research Fund Committee serves as a screening committee to evaluate the proposals. Application information may be obtained from the Dean of the Graduate School.

Counseling and Testing Center—The University Counseling and Testing Center provides a general resource of help for all students who are concerned about a variety of things. Students struggling with educational, vocational, or more personal concerns are offered the personalized attention of college counseling specialists. Through individual counseling, group counseling, and testing where appropriate, students have the opportunity to learn more about themselves and the world in which they live. The Center's main function is to encourage each student to discover his unique being and to determine how to relate this to his environment. Although this is the Center's first responsibility, students are helped to get whatever other assistance they may want.

Besides counseling, the Center presents a number of other services. Students interested in learning about their interpersonal relations are offered encounter groups. Those who want to learn more about efficient reading and study skills can enroll in sessions designed to meet this need. Interest inventories, aptitude tests and personal preference instruments designed to enhance a student's self-knowledge are available upon request. Tests required for admission to graduate school or for employment placement are also administered. In addition, the Center maintains an educational-vocational library and a selection of current college catalogs.

Interested students may come to the Center either for a single interview or for a series of weekly meetings as often as they wish. Appointments may be made by going to the Counseling and Testing Center, 102 Education Building, or by phoning 7937. All students, regardless of college, major, or standing, have the right to use the Center free of charge.

Office of Career Planning and Placement—Through this office the University offers career planning and placement services to undergraduate and graduate students and alumni in both teaching and non-teaching fields. Established as the Placement Bureau in 1935 in cooperation with the General Alumni Association, the office offers the following services to registrants and employers:

1) Counsels and assists students and alumni in career planning.
2) Notifies registrants of suitable employment opportunities.
3) Assists candidates in preparing and presenting effective applications.
4) Cooperates with employers in their search for qualified personnel.
5) Develops career information for University men and women in both new and traditional fields of opportunity.

The office schedules each year an extensive and informative on-campus interviewing program for students with representatives from both teaching and non-teaching fields. Assistance is also given students in locating summer vacation employment.

The College Teacher Division serves candidates for master and doctoral degrees interested in employment in college and university positions.

Presently employed alumni teachers are offered assistance in maintaining continuous records of achievement to facilitate professional advancement by the Alumni Teacher Placement Division located in Coburn Hall.

No charge is made to students, alumni, or employers for the services of the Office.

Office of Student Aid—The Office of Student Aid receives applications for student aid including part-time employment, Work Study Program, scholarships, University loans, loans under the National Defense Education Act, and Educational Opportunity grants. Detailed information on student aid will be found on pages 37, 43 and 53. Information on loan funds and scholarships is contained in a special Financial Aid Bulletin, available on request.

Foreign Student Adviser—The University maintains an office for the information and assistance of all students who are not citizens of the United States. All foreign nationals are required to register with this office in the East Annex, Orono, at the beginning of each academic year.

The University wishes that each international student have the best possible educational and personal experience while he is in the United States and especially while at the University.

The Foreign Student Adviser's office assists the student to interpret in appropriate situations the administrative regulations of the institution; local, state, and national laws; accepted standards of conduct; and expectations and reactions of those he will encounter while in a new cultural and community environment.

All International Students including those with "F" student or "J" exchange student status must report to the Foreign Student Adviser's office as soon as convenient after arrival on campus. Advice concerning immigration regulations, necessary forms, etc., are available so that international students may remain in the United States as long as properly necessary to achieve their educational goals.

Health Service—The Student Health Center is organized and operated for the benefit of students. Supervision of medical care and health needs afforded by a family physician is the goal of this program. Insofar as possible, all aspects of a personal doctor-patient relationship are preserved. The following services are offered at no charge to eligible students:

1. Twenty-four-hour emergency care, including weekends when the University is in session; emergency visits by the physician when necessary. (Medical services are not available during vacations.)
2. In-patient care in the Infirmary as needed, including physician visits, nursing care, medicines, and diagnostic tests.
3. Consultations with staff physicians and surgeons for diagnosis and treatment during regular clinic hours.
4. Limited dispensing of medicines on an out-patient basis.
5. Routine immunization, allergy injections, etc.
6. Limited diagnostic laboratory tests, x-rays, and physical therapy.

7. Follow-up examinations for various athletic activities, pre-employment physical examinations, and other routine physical examinations.
8. Coordination of the Health Insurance Program to insure maximum benefits to the students when illness requires hospital treatment or consultation with physicians not on the Health Center staff.
9. Supervision of the University environment to minimize exposure of students to health hazards.
10. A Mental Health Section, under the direction of a clinical psychologist, provides evaluation and therapy for students with personal and emotional problems. Treatment is offered for problems of long standing as well as those acute problems brought on by the pressure of University life. The length of therapy is dependent upon the student's needs.

To meet these goals, a new Student Health Center was completed in 1968 consisting of out-patient clinics, laboratory, x-ray and physiotherapy facilities and 32-bed infirmary. The staff consists of four full-time physicians, two clinical psychologists, a surgical consultant, a psychiatric consultant, and adequate nursing and technical help. Care is extended to students at South Campus through a dispensary in the Bangor City Hospital.

No major steps in health care of individual students are undertaken without consultation with the student's parents except in extreme emergency cases when the parents cannot be located.

Office of Religious Affairs—The Office of Religious Affairs consists of a Committee on Religious Affairs and a Director of Religious Affairs. The director of religious affairs, whose office is on the second floor of the Memorial Union, serves as adviser to the Student Religious Association, counselor to students, and works toward coordination among the faith groups and between these groups and the University.

Committee on Religious Affairs—Subject to the approval of the president and the Board of Trustees, the Committee on Religious Affairs serves as the policy-making group in the area of religion at the University of Maine. It oversees the activities of the Student Religious Association and functions as the official body through which the faith groups are related to the administration of the University.

Use of Laboratory Apparatus—Many laboratory courses involve instruction in and the use of various types of power equipment and laboratory apparatus. The University takes every precaution to provide competent instruction and supervision of such courses. It is expected that students will cooperate by following instructions and exercising caution. In case an accident does occur, resulting in personal injury, the University can assume no responsibility except for medical care that is provided by the Student Health Service. Student Health and Accident Insurance is recommended.

Registration—Undergraduates will register in accordance with the following:
FRESHMEN—All members of the incoming freshman class are required to

attend, during the summer preceding the beginning of classes, any one of the several freshman orientation sessions at the Orono campus. The dates when these are held each year are furnished incoming freshmen and their parents. It is strongly urged that parents plan to attend the orientation program with their sons and daughters.

During the orientation period, registration is accomplished for the fall semester, Also, information is distributed concerning arrangements in connection with the beginning of classes, arrival at dormitories, etc., in September.

UPPERCLASSMEN—In the fall, upperclassmen will be required to register by mail prior to, or in person on, the day specified or to present written evidence that they have been allowed by their dean to register late. Upperclassmen must communicate in advance with the dean of their college giving their reason for wishing to register late, and have received from him written permission to do so. In the event of an unusual circumstance wholly beyond the control of the student, and occurring just before the opening of the fall term, the student may present his case in person to the dean upon his arrival at the University.

Academic advisers are assigned all students for help in planning their educational programs, to ensure their meeting graduation requirements, for counsel and guidance in academic work, and for advice about study or classwork problems. The final responsibility for fulfilling degree requirements, however, rests with each student.

Degrees—The University awards the following degrees:

Associate in Applied Science (A.A.S.), with specification of the major field, to those who complete the two-year curriculum in the College of Life Sciences and Agriculture. Orono campus only.

Associate in Business Administration (A.B.A.) to those who complete the two-year curriculum. Offered only on the Portland campus.

Associate in Engineering (A. Eng.) to those who complete the two-year curriculum in the College of Technology. Orono campus only.

Associate in Administration (A.A.B. and A.A.P.) to those who complete the two year curriculum. Offered only at the University of Maine in Augusta.

Associate in General Education (A.G.E.) to those who complete the two-year curriculum. Offered only at the University of Maine in Augusta.

Associate in Liberal Studies (A.L.S.) to those who complete the two-year curriculum. Offered only at the University of Maine in Augusta.

NOTE: Proposals are pending to consolidate associate degree offerings into two categories of Associate of Science in————and Associate of Arts in ————, with designation of the major field. However, at press time (May 1969) the above listing is correct. Inquiries about possible changes can be made at the collegiate deans' offices.

Bachelor of Arts (B.A.) with specification of the major subject, to those who complete a four-year curriculum in the College of Arts and Sciences, except students in the School of Nursing. Orono and Portland.

Bachelor of Music in Applied Music (B. Mus.) to those who complete the prescribed four years' work in the College of Arts and Sciences. Orono only.

Bachelor of Science (B.S.) to those who complete the prescribed work of four years in the Colleges of Life Sciences and Agriculture, Technology, and

Business Administration, or in the School of Nursing in the College of Arts and Sciences.

Bachelor of Science in Education (B.S. in Ed.) or Bachelor of Science in Music Education (B.S. in Mus. Ed.) is conferred upon students who complete the prescribed work in the College of Education.

Bachelor of Laws (L.L.B.) or Doctor of Law (J.D.) to those who complete the three-year curriculum in the School of Law.

A minimum residence of one year is required for the attainment of any bachelor's degree. This regulation refers to the senior year.

The following advanced degrees are offered by the Graduate School and are, unless otherwise noted, available only at the Orono campus.

Master of Arts (M.A.) and Master of Science (M.S.) with designation of the major subject or field; Master of Arts in Teaching (M.A.T.), or Master of Education (M.Ed.), granted for one year's graduate work completed with distinction. The M.Ed. (three Secondary Teaching Programs) is offered also at Portland.

Master of Agricultural and Resource Economics (M.A.R.E.).

Master of Business Administration (M.B.A.), Orono and Portland.

Master of Engineering (M.E.) with departmental designation, Portland and Orono.

Master of Library Service (M.L.S.), Orono and Portland.

Master of Mechanical Engineering (M.M.E.).

Master of Public Administration (M.P.A.).

The Certificate of Advanced Study (C.A.S.), designed for teachers and school administrators. Awarded for the completion of a planned program of 30 hours of work beyond the Master's degree.

Doctor of Education (Ed.D.).

Doctor of Philosophy (Ph.D.), offered in animal nutrition, chemical engineering, chemistry, civil engineering, history, oceanography, physics, plant science, general and experimental psychology, clinical psychology, and zoology.

Baccalaureate Degrees With Distinction are conferred at commencement for the following attainments in rank.

Seniors having an average grade of 3.50 or above will be graduated with highest distinction, 3.25 to 3.49 with high distinction and 3.00 to 3.24 with distinction if they meet the criteria listed below.

The average grade is based on the work of the first three and one-half years, which must include at the time of graduation three years of resident study at the University of Maine. Candidates must have completed seven-eighths of the required hours at the end of the fall semester of the senior year. Candidates must take their senior year at the University of Maine.

Degree with Honors, with High Honors, or with Highest Honors are awarded to seniors who successfully complete the Honors Program.

Grading System—Grades at the University are given in terms of letters as follow. (For purposes of comparison these letters carry the following arbitrary values for undergraduate students: A=4, B=3, C=2, D=1, E=0; for graduate students both D and E grade=0.)

Passing undergraduate grades: A, high honors; B, honors; C, satisfactory,

successful, and respectable meeting of the course objectives; D, low level passing; Q, passed for degree credit on a *Pass-Fail* basis.

Passing graduate grades: A, high honors; B honors; C, may be considered satisfactory by specific approval of student's advisory committee. *Acceptable,* applied to satisfactory theses only.

Failing grades: E, failed.
F, failed *Pass-Fail course.*
L, registered for course. Non-attendance reported, no withdrawal on file. Equivalent to an E.
Y, dropped with grade of E.

Progress grade: R, final grade deferred (used only in reporting a thesis registration).

Grades held in abeyance: X, absent from final examination; Z, deficiency in course work; X and Z change to an E grade if not made up within periods stated in the Handbook.

Non-credit grades: H, audited course; P, passed non-credit course or, when noted, withdrew passing; W, dropped without penalty.

Each college sets its own graduation requirements in terms of grades or grade points.

A candidate for a bachelor's degree must: (a) receive passing grades in all courses required by his major department: (b) accumulate the number of degree hours specified by the college in which he is registered; (c) achieve an accumulative average of not less than 1.80 except in the College of Education, which requires an accumulative average of not less than 2.00.

The degree hours are the sum of the course credit hours of those courses which may be counted toward a degree, provided a passing grade has been received.

The accumulative average is the quotient of the grade points divided by the total hours, carried to two decimal places. The grade points are the product of the course credit hours and the numerical value of the letter grade: A=4, B=3, C=2, D=1, E=0. The total hours are the sum of the course credit hours from all courses.

GRADE REPORTS are sent to the parents of all students at the end of each semester. Progress reports are sent to the parents of freshmen at the middle of each semester. Grade reports for the Summer Session are sent to the parents of all students from the University who are attending the session.

Parents are notified whenever a student is placed on, continued on, or removed from probation. (This procedure is omitted in the case of veteran students who are of legal age.)

Considerable care is taken to ensure that course registrations and grades entered on a student's permanent record are accurate. Any student who, upon receipt of a semester final grade report, suspects an error has been made should take the matter up immediately with the Registrar's Office. Records are assumed to be correct if a student does not so report to the Registrar's Office within six months of the completion of a course. At that time portions of the record are committed to microfilm, which cannot be emended.

Student Registrations—It is assumed that all students entering the University are willing to subscribe to the following: *A student is expected to show, both*

within and outside the University, respect for order, morality, and the rights of others, and such sense of personal honor as is demanded of good citizens.

The University requires certain standards of academic performance and of general good character for admission; if these are not maintained, the University suspends or dismisses the student. Every effort is made to provide adequate academic and personal counseling for all students, with the aim of enabling them to successfully complete their courses of study.

Freshmen are not permitted to have or operate motor vehicles at the University of Maine. This regulation prohibits a freshman from keeping an automobile on the campus or in Orono or vicinity. Students are expected to observe the spirit as well as the letter of the regulation and the cooperation of parents is solicited in the operation of the rule. Exceptions may be made by the Dean of Men or the Dean of Women in cases of freshmen who commute daily from their homes.

Upperclass students are allowed to have and to operate motor vehicles on the campus, but all such vehicles must be registered in the office of Mr. Edward McLaughlin, Security Officer, Lord Hall, and bear an official University sticker. There is a registration fee of $1.00. In addition, evidence of automobile liability insurance must be shown.

Each student is expected to be present at every college exercise for which he is registered.

Dismissal and Suspension—Students may be dismissed or suspended from the University for unsatisfactory work (academic dismissal* or suspension), for misbehavior (disciplinary dismissal or suspension), or for mental or physical health problems (administrative disenrollment). Dismissed* students are ineligible to *apply* for readmission for one year from date of dismissal; suspended students may apply for readmission effective upon termination of suspension. Dismissed* students are ineligible to register for credit or non-credit in any division of the University for one year following dismissal; suspended students for the duration of the suspension.

Withdrawal—Students who desire to withdraw from the University for any reason must secure a withdrawal slip from the Registrar's Office and have it completed. Failure to do so may result in failing grades being recorded in all courses at the end of a semester. Additionally, withdrawal after the final date of the "withdrawal with penalty" period set by the University as detailed in student regulations, except for approved emergency reasons, will also result in failing grades.

Change of Campus (Orono-Augusta-Portland) A student wishing to change campuses should secure from his Dean's Office a *Change of Campus Request* form and follow carefully the instructions thereon.

Drinking—The possession or use of intoxicating beverages is prohibited on the University of Maine campus and at all University functions whether held on or off campus.

Physical Examination—The University requires that all entering students, freshman, transfer, graduate, and special, have a physical examination, tuberculin skin test and also chest X-ray if the latter seems indicated. Physical examinations and tuberculin tests may also be required of students seeking readmission to the University.

Detailed information about the regulations affecting students is contained in

a pamphlet entitled *The Maine Handbook* obtainable at the Office of the Dean of Students.

**Exception*: *First* (fall) *semester freshmen* dismissed in January for low grades (academic dismissal) may apply for readmission effective the end of the ensuing spring semester, at which time they may register otherwise, as well, without waiting for an entire year to elapse.

Responsibility for Personal Property—*The University does not under any circumstances assume responsibility for loss of or damage to personal property through fire, theft, or other causes. Persons desiring protection against possible loss or damage should purchase appropriate insurance unless it is found that parents already have desired coverage by means of a family policy.*

THE UNIVERSITY HONORS PROGRAM

General—The University Honors Program is open to all qualified undergraduate students in the University. Its purpose is twofold: (1) to introduce students of high scholastic potential to the major areas of knowledge—mathematics and science, social studies, literature, philosophy, and fine arts—through individual reading and small group discussion; and (2) to develop their skills to as high a degree as possible in the field in which they choose to concentrate.

The program in the freshman and sophomore years is the same for all colleges and is administered by the Honors Council. Its task is the orientation of the student to the broad perspectives of the academic world.

The programs for the junior and senior years vary somewhat from college to college and are administered by the Honors Committee of each college. Their task is to sharpen and focus the student's abilities in his own field of specialization.

Content—Students who are designated as Distinguished Maine Students, as well as a limited number of other highly qualified students (see page 37), may begin honors work in the fall semester of the freshman year in a seminar in which a limited number of books, chosen to cover the major intellectual disciplines, are discussed under the leadership of a faculty member. In the spring semester other qualified freshmen join the program. Honors work in that semester consists of a colloquium in which readings concerned with the seminal ideas of Western civilization are discussed by students with a faculty leader. The sections of the freshman seminar and colloquium are limited to 12 to 14 students each.

During the sophomore year, honors work is based on small group tutorials, each group consisting of three or four students. Each group meets weekly with a tutor for the discussion of books and ideas from the honors reading list. Every group does substantial reading in three or four major areas of thought each semester.

In the junior year the student begins his concentration in his major field. His work in honors may be a course of study under tutorial supervision designed to

acquaint him with his major field, or, at the option of his college Honors Committee, he may take an interdisciplinary seminar in one semester of the year.

For the senior year, a thesis or research project, within or closely related to his field of primary interest, is the major part of his Honors Program. A final comprehensive examination before a faculty board tests the student's accomplishments in both objectives of the program: breadth of knowledge and depth of specialization within his major field.

Degree—The degree of honors awarded—Honors, High Honors, Highest Honors—depends upon three factors: the student's accumulative average over seven semesters; the quality of his senior thesis or project; his performance on the comprehensive examination. In order to receive a degree with Honors, a student must have a minimum of four semesters of work in the Honors Program, including both semesters of the senior year, and at least one semester of sophomore group tutorials.

Entry—Normally, entry into the Honors Program, except for Distinguished Maine Students and a few others, occurs at the start of the second semester in the freshman year. However, a substantial number of students are admitted at the beginning of the sophomore year, some at mid-years in the sophomore year, and a small number at the beginning of the junior year.

Admission—Students are recommended for the Honors Program by the Honors Committee of the college in which they are registered and admitted to the freshman and sophomore programs by the Honors Council. To be eligible for consideration for the Honors Program, a student should normally have a point average of 3.0 or better, have high C.E.E.B. test scores, and show curiosity, initiative, and intellectual flexibility in the work he has done. Students wishing to join the Honors Program should consult the secretary of their college Honors Committee: Life Sciences and Agriculture, Prof. R. J. Campana, 215 Deering Hall; Arts and Sciences, Professor R. B. Thomson, 15 North Stevens; Business, Associate Professor Jean Goodman, 20 South Stevens; Education, Professor G. H. Davis, 132 Education Building; Technology, Professor R. C. Hill, 112 Boardman Hall; University of Maine in Portland, Associate Professor H. D. Hunt, Bonney Hall.

Council—The University Honors Council, consisting of the Vice President for Academic Affairs as chairman, Professors Hill, Davis, Campana and Thomson, and Associate Professors Goodman and Hunt, administers the common program of the first two years and coordinates the work of the College Honors Committees. All questions in regard to the University Honors Program should be addressed to Professor Thomson, 15 North Stevens, Director of the University Honors Program.

Descriptions of honors courses will be found in the Arts and Sciences section of the catalog.

PRESIDENTIAL SCHOLARS

Each year 20 entering freshmen judged academically superior on the basis of their secondary school records, test scores, and recommendations are invited to become Presidential Scholars. Awards of $500 for 16 Maine students and $1,000 for four out-of-state students are granted for the freshman year. Presidential Scholars are invited to enter the University Honors Program as first-semester freshmen.

DISTINGUISHED MAINE STUDENTS PROGRAM

In 1963 the Board of Trustees approved a program aimed at recognizing outstanding graduates of Maine secondary schools who are admitted to the University of Maine as regular, full-time students. Such students are designated as "Distinguished Maine Students." Recipients of this honor are selected primarily on the basis of three criteria: (1) outstanding preparatory school records; (2) strong potential as indicated by test scores, and (3) excellent personal recommendations from secondary school officials.

Students who are selected receive certificates of recognition from the University. which are sent prior to the date of secondary school commencement. The secondary school from which each Distinguished Maine Student graduates is also notified of the student's selection for this honor.

Distinguished Maine Students, along with a few other highly qualified students, may enroll in the first semester seminar of the University Honors Program. In this course students read a limited number of books, which are representative of the major fields of learning, and discuss them under the guidance of a faculty member. The seminar presents a unique opportunity for first-semester freshmen to participate in an unusual academic program.

A primary aim of the Distinguished Maine Students Program is to call attention to the academic accomplishments of talented Maine youth and to give these accomplishments suitable recognition. At the present time 50 students per year are selected for this honor. Recipients of the Distinguished Maine Student designation are selected by the Director of Admissions and the University Honors Council, acting jointly. Credentials of all applicants for regular admission are reviewed in the selection process; no special application is required or accepted.

STUDENT ACTIVITIES

Cooperative Government—The organizations through which cooperative government is effected are the following:

THE GENERAL STUDENT SENATE seeks to promote the general welfare of the student body and the best interests of the University. It is composed of representatives from campus living areas and those elected by off-campus students. Four officers are elected in the spring of every year. The Senate is responsible for appointing student members of committees, for campus elections, for events such as Maine Day and for consideration of any business properly brought before it.

THE ASSOCIATED WOMEN STUDENTS, composed of all regularly enrolled undergraduate women, is the organization that promotes women's affairs on the campus, including the administration of self-government in the dormitories and the sponsorship of cultural, social, and educational programs for women. The AWS is a member of the Intercollegiate Association of Women Students.

Religious Affairs—Six religious groups provide opportunities for worship, study, conversation, and witness: The Episcopal Church at the Maine campus for Episcopal students, Hillel Foundation for Jewish students, Maine Christian Association for Protestant students, and Our Lady of Wisdom Chapel and the Newman Apostolate for Roman Catholic students. The chaplains are available for counseling or instruction. The Intervarsity Christian Fellowship, an approved student organization, meets weekly in the Memorial Union. The Christian Science Organization meets for study and worship each week in the Drummond Chapel of the Union Building.

THE STUDENT RELIGIOUS ASSOCIATION, called SRA, is the coordinating agent of the recognized faith groups and religious activities of the campus and is governed by a cabinet of representatives from the student members of these groups.

LOCAL CHURCHES AND SYNAGOGUES—The churches and synagogues of Orono, Old Town, and Bangor always welcome the attendance of University students. A small meditation room, the Drummond Chapel, next to the Office of Religious Affairs is open at all times.

Scholastic Honor Societies—These groups recognize attainment and promise in the academic field by selecting for membership undergraduates whose accumulative point averages are not lower than 3.0 after completing five or more semesters of college work or 3.3 after completing less than five semesters. The date indicates when the chapter was established at the University.

PHI KAPPA PHI (1900)—All colleges
TAU BETA PI (1911)—Engineering
PHI BETA KAPPA (1923)—College of Arts and Sciences
NEAI MATHETAI (1925)—Freshman Women
OMICRON NU (1931)—Home Economics
KAPPA DELTA PI (1932)—College of Education
SIGMA XI (1948)—Scientific research

Student Organizations—A complete descriptive listing of departmental and professional honor societies, departmental clubs, and other student organizations appears in the student *Handbook*. Copies are available at the Director of Student Services' office.

Musical Organizations—Students have many opportunities to continue their musical training and experience, either through the degree programs in music (details of these programs are listed under the College of Arts and Sciences and the College of Education), or through participating in any of the several organizations either for credit or non-credit. There are also smaller instrumental ensembles for the more advanced musicians.

For a description and course numbers of the following musical organizations, see the music courses listed in the College of Arts and Sciences section of this catalog.

UNIVERSITY SINGERS—U of M's most select choral organization; 46 members, tours the State annually . . . New England tour spring 1969 . . . planning extensive tours for the future. Performs a varied program of literature ranging from 16th Century to present, including folk songs and spirituals.

UNIVERSITY ORCHESTRA—A full symphony orchestra of 55 players composed primarily of students, with limited augmentation from the Bangor Symphony. Presents several concerts during year with guest soloists, assists in performances by the Oratorio Society.

ORATORIO SOCIETY—Chorus of 180 mixed voices performing the major works for chorus, orchestra, and soloists. Presents two concerts each year on the *Concert Series.*

CONCERT BAND—Seventy-five carefully selected players. Numerous concerts during the year and an extended State tour each spring.

MARCHING ONE HUNDRED—U of M's elite marching band which performs during football season with a corps of twirlers and "Honey Bears." At the invitation of Governor Curtis, represented State of Maine at Fenway Park, Boston, for AFL game November 2, 1968, nationally televised in color over NBC.

CHAMBER CHOIR—Sixteen select voices specializing in literature especially written for this performing medium. Limited off-campus appearances.

VARSITY BAND—Organized each fall following football season for performing at basketball games and other functions.

VARSITY MEN'S AND VARSITY WOMEN'S GLEE CLUBS—To be organized fall of 1969 for performing music written expressly for these mediums. Public concerts plus limited tours.

ENSEMBLES: BRASS, WOODWIND, STRING—Limited participation by qualified students for study and performance of chamber music written especially for small ensembles.

Maine Masque Theatre—As the University Theatre, it is an integral part of the academic and co-curricular program of the Department of Speech. The theatre provides an opportunity for all students to participate in every aspect of theatrical production, including stage and house managing, lighting, costuming, acting, directing, publicity, scenery, properties, and makeup. As a contribution to the cultural growth of the University community, the theatre offers productions which cover the full range of dramatic expression. Membership in the Maine Masquers, a local theatre honor society, may be gained through participation in the theatre's program.

Debate and Forensics—The University forensic program provides opportunities for experience in debate, discussion, extemporaneous speaking, oral interpretation, and original oratory. The program, under the administration and supervision of the Department of Speech, is open to all undergraduate students. Representatives participate in extensive intercollegiate competition with major colleges and universities from the entire United States, as well as engaging in

intramural programs on campus. Membership in the Maine Debating Council and Pi Kappa Delta may be obtained through participation in forensic activities.

Radio and Television—Students from the entire University have an opportunity, through working on stations WMEB-FM and WMEB-TV, to participate in all phases of radio and television broadcasting. With studios in 275 Stevens Hall, WMEB-FM is operated with a faculty and student staff as an integral part of the academic and co-curricular program of the Department of Speech. WMEB-TV, operated by the Maine Educational network, has studios in Alumni Hall. The varied program enables the student to gain valuable experiences in engineering, programming, announcing and writing.

Student Publications—The University's regular student publications are:

THE MAINE CAMPUS, a newspaper published weekly.

THE PRISM, an illustrated annual.

UBRIS, a literary magazine published semi-annually.

The Student Publication Committee, a joint faculty-student group, is the publishing board for all the University's student publications, except the Law Review of the School of Law.

Social Fraternities and Sororities—The following fraternities and sororities have chapters at the University. The figures in parentheses are the dates they were established.

FRATERNITIES—National: Beta Theta Pi (1879), Kappa Sigma (1886), Alpha Tau Omega (1891), Phi Kappa Sigma (1898), Phi Gamma Delta (1899), Sigma Alpha Epsilon (1901), Sigma Chi (1902), Theta Chi (1907), Delta Tau Delta (1908), Lambda Chi Alpha (1913), Sigma Nu (1913), Phi Mu Delta (1923), Alpha Gamma Rho (1924), Tau Epsilon Phi (1929), Sigma Phi Epsilon (1948), Tau Kappa Epsilon (1948), Alpha Delta Upsilon (colony, 1968). Local: Phi Eta Kappa (1906).

SORORITIES—National: Alpha Omicron Pi (1908), Phi Mu (1912), Delta Delta Delta (1917), Pi Beta Phi (1920), Chi Omega (1921), Delta Zeta (1924), Alpha Chi Omega (1958), Alpha Phi (1963), Alpha Delta Pi (1968), Sigma Kappa (1968).

Admission

All correspondence concerning undergraduate admission and financial aid should be addressed to the Director of Admissions, Wingate Hall, University of Maine, Orono, Maine 04473. Maine students who desire to attend the University of Maine in Portland (see section of catalog devoted to University of Maine in Portland) should write to the Director of Admissions, University of Maine in Portland, 96 Falmouth Street, Portland, Maine 04103. Maine students who plan to begin their programs at the Augusta campus, 99 Western Ave., Augusta, Maine 04330, should indicate this fact on their applications. The Portland and Augusta Campuses are commuter campuses. All applications are filed at our Orono office. At the present time there are no dormitory facilities at the Portland and Augusta campuses.

Applicants for admission to the Graduate Division should write directly to the Dean of the Graduate School, Winslow Hall, University of Maine, Orono, Maine 04473.

ADMISSION TO THE FRESHMAN CLASS

The approval of candidates for admission is on a selective basis. The University is interested in candidates whose preparatory program, scholastic achievement, aptitudes, interests, character, health, and established study habits give definite promise of success in a senior college program. The University admits men and women, both residents of Maine and non-residents; it reserves the right to terminate admissions whenever the capacity of the University to care properly for the students has been reached.

The candidate is required to submit a carefully answered questionnaire concerning favorite studies, school activities, community interests, hobbies, choice of college course and other matters bearing upon preparation for a college program. This information is required so that the University may better guide the student in selecting courses of study best suited to his individual abilities, aptitudes, and interests.

All four-year degree candidates are required to submit the scores on the College Entrance Examination Board Scholastic Aptitude Test (S.A.T.), and the scores on three C.E.E.B. Achievement Tests. (For details, see section concerning the C.E.E.B. which follows).

Candidates for admission to the freshman class should file their applications in the fall of the year prior to the date they plan to begin their studies.

The required application forms (which are revised each year) may be obtained by writing to the Director of Admissions. *A non-refundable application fee of $10 is required of all applicants.* Applicants must apply for admission prior to March 1 for equal consideration with other candidates. Applications received after this date will be marked "Late" and considered only as classroom and dormitory capacities allow.

UNIVERSITY OF MAINE

Candidates for the freshman class normally are accepted for the opening of the academic year in September. (It is not our policy to admit transfer freshmen in the middle of the academic year.) The priority of the housing assignment is based primarily on the date of formal acceptance by the Committee on Admissions. *Certificates of admission issued prior to the completion of the current school year may be rescinded if the final report in June is unsatisfactory.*

SCHOLASTIC APTITUDE AND ACHIEVEMENT TESTS

All candidates for admission to four-year degree programs are required to take the Scholastic Aptitude Test (S.A.T.) and three Achievement Tests administered by the College Entrance Examination Board. Candidates are urged to take the December and/or the January tests. The Achievement Tests should include English composition, [Level I Mathematics is also required of all engineering candidates] and two other tests of the candidate's choice, or as recommended by the Director of Admissions. [Candidates for the two-year technical programs in the College of Life Sciences and Agriculture, the two-year associate degree program in Business Administration at the Portland Campus, and the two-year, associate degree programs in Administration and General Education at Augusta, take the Scholastic Aptitude Test only.] High school juniors are encouraged to take achievement tests in *non-continuing* subjects on the May or July testing dates. Guidance counselors should be consulted prior to registering for such tests.

Arrangements to take the C.E.E.B. Tests should be made by writing to the College Entrance Examination Board, P.O. Box 592, Princeton, New Jersey, for application forms and information. *Arrangements must be made at least one month before the testing date.*

The College Entrance Examination Board will administer tests on each of the following dates:

Saturday, November 1, 1969 (Sat only)	Saturday, March 7, 1970
Saturday, December 6, 1969	Saturday, May 2, 1970
Saturday, January 10, 1970	Saturday, July 11, 1970.

ADVANCE PLACEMENT

In certain subjects, candidates who have completed advanced work in secondary schools may apply for advanced placement and credit at the University of Maine. Candidates interested in advanced placement and credit must take the Advanced Placement Test, or Tests, administered by the College Entrance Examination Board. Each case will be considered individually on its own merits.

"Candidates who have completed advanced work in certain subjects or who have had training and/or experience in certain professional or semi-professional fields may apply for advanced placement and credit at the University of Maine. Candidates interested in advanced placement and credit may take either appropriate standardized tests, such as those prepared by the College Entrance Examination Board, or examinations especially developed by the academic unit concerned."

VETERANS ADMINISTRATION INFORMATION

Mrs. Alice F. Harkins is prepared to help veterans and children of disabled and deceased veterans. Requests for information concerning Veterans Administration educational benefits should be forwarded to the Registrar's Office, Wingate Hall, University of Maine, Orono, Maine 04473.

Former students of the University as well as prospective students should submit their applications for admission to the University to the Director of Admissions. Applications for a Candidate of Eligibility should be made at a Regional V.A. Office.

SPECIAL LIVING ARRANGEMENTS (ORONO CAMPUS)

Applications for residence in Colvin Hall, women's cooperative dormitory, and the University Cabins for men, should be included with the application for admission. The necessary forms (financial aid) may be obtained from the Director of Admissions.

Unmarried freshman students shall live in one of the University housing units unless they can live at home. Exceptions to this rule are seldom considered by the University. Students requesting such exceptions must indicate this fact on the application card. In addition, the student must write a separate letter (to be sent along with the application) explaining in detail his housing plans, the reason for requesting an exception to the rule and the name of the person with whom he wishes to live. Such requests will be carefully reviewed by the Dean of Women or the Dean of Men.

FINANCIAL AID AND SCHOLARSHIPS

Applications for financial grants, loans under the National Defense Education Loan Plan, for participation in the Work-Study Program under the Economic Opportunity Act of 1964, and assistance under the Higher Education Act of 1965 may be obtained from the Director of Admissions. Parents or legal guardians of all applicants for financial aid are required to file a Parents' Confidential Statement with the College Scholarship Service. Forms and information are available in each local high school. Requests for aid will be reviewed by the committee after the applicant has been formally notified of acceptance by the Director of Admissions. The University financial aid form should be filed before March 1, and preferably at the time the admission application is filed.

The University participates in the College Scholarship Service (CSS) of the College Entrance Examination Board. Participants in CSS subscribe to the principle that the amount of financial aid granted a student should be based upon financial need. The CSS assists colleges and universities and other agencies in determining the student's need for financial assistance. Entering students seeking financial assistance are required to submit a copy of the Parents' Confidential Statement (PCS) form to the College Scholarship Service, designating the University of Maine as one of the recipients. The PCS form may be obtained from a secondary school or the College Scholarship Service, P.O. Box 176, Princeton, New Jersey 08540 or P.O. Box 1025, Berkeley, California 94704. This form should be completed by January 1.

Upperclass students may apply annually during designated periods for all types of financial assistance. Applications and PCS forms are available at the Office of Student Aid.

Part-time work opportunities, both on-campus and off-campus, are available to students. From applications filed each year, the Office of Student Aid refers students to suitable job openings as they are received. A satisfactory academic standing must be maintained during the working period. Freshman students are not encouraged to undertake part-time jobs that require an excessive amount of time.

A specially prepared bulletin entitled Financial Aid is available from the Director of Student Aid upon request. Detailed descriptions of all types of financial aid programs are included, together with a descriptive summary of each scholarship and loan fund held or administered by the University.

REQUIREMENTS FOR ADMISSION

COLLEGE OF ARTS AND SCIENCES

English	4 units
Foreign Language	2 units in one language
Algebra	2 units
Plane Geometry	1 unit
History or Social Science	1 unit
Electives†	6 units
Total	16 units

†Chemistry is recommended as an elective for Science, Medical Technology and similar curricula, and required for the Nursing program.
†½ unit in Trigonometry is recommended for students who plan to major in Mathematics or Science.

COLLEGE OF BUSINESS ADMINISTRATION

I.

English	4 units
Algebra	2 units
Plane Geometry	1 unit
History or Social Science	1 unit
Electives	8 units
Total	16 units

II. Two-Year Associate Degree Program in Business Admin.—Portland campus. (See section concerning Portland campus.)

III. Two-Year Associate Degree Programs—Augusta campus. (See section concerning Augusta campus.)

COLLEGE OF EDUCATION

(Includes curriculum in Physical Education)

English	4 units
Three units from one and two units from another of the following:	
Foreign Languages Mathematics Natural Sciences Social Studies	5 units
Electives	7 units
Total	16 units

United States History, Natural Sciences, and two units of Mathematics are recommended. Algebra I and II and Plane Geometry are required of those students who wish to prepare for teaching mathematics or science.

COLLEGE OF LIFE SCIENCES AND AGRICULTURE

I. Animal Sciences, Plant and Soil Sciences, Agricultural and Resource Economics, Agricultural Engineering, Agricultural Mechanization, Biological Sciences, School of Forest Resources.

English	4 units
Algebra	2 units
Plane Geometry	1 unit
Trigonometry (Agric. Engineering only)	½ unit or its equivalent
Science	2 units (one of which must be chemistry or physics)
History or Social Science	1 unit
Electives	5½-6 units
Total	16 units

II. School of Home Economics:

English	4 units
Mathematics	2 units (at least 1 yr. of algebra)
Science	1 unit (chemistry recommended)
History or Social Sciences	1 unit
Electives	8 units
Total	16 units

III. Two-Year Technical Division (Orono campus only):
Candidates for admission to the Two-Year Technical Programs in Life Sciences and Agriculture must have graduated from high school and must

complete the C.E.E.B. Scholastic Aptitude Test. (C.E.E.B. Achievement Tests are not required). A student should have two units of high school mathematics, one of which must be algebra. Students who contemplate transfer to the regular four-year curriculum must satisfy entrance requirements for the College of Life Sciences and Agriculture.

COLLEGE OF TECHNOLOGY

I.	English	4 units
	Foreign Languages	——(Two or more units in one language recommended but not required)
	Algebra	2 units
	Trigonometry	½ unit or its equivalent (not required for two-year engineering technology programs—See below)
	Plane Geometry	1 unit
	Chemistry or Physics	1 unit
	History or Social Science	1 unit
	Electives	6½-7 units
	Total	16 units

In addition to these course requirements, applicants must further qualify themselves by satisfactory performance on the Level I Mathematics Achievement Test administered by the College Entrance Examination Board.

II. Two-Year Engineering Technology Division (Orono campus only): Candidates for admission to one of the Two-Year Engineering Technology Programs must have completed the same courses as required of the four-year degree candidates with the exception of trigonometry. Also, candidates are required to complete the C.E.E.B. Scholastic Aptitude Test and three Achievement Tests (English Composition, Level-I-Math., and Physics or Chemistry).

PORTLAND CAMPUS

I. Candidates for admission to the four-year degree programs (see section on Portland campus) must meet the same requirements as those students admitted to Orono in similar programs.

II. Two-Year Associate Degree Program in Business Administration—Candidates for admission to this program must have graduated from high school and must complete the C.E.E.B. Scholastic Aptitude Test. A candidate's verbal aptitude will receive special attention in the selection of freshmen for this program.

AUGUSTA CAMPUS

I. Two-Year Associate Degree Program in Liberal Studies—This is a parallel (transfer) program. All candidates must meet the same entrance requirements as those students admitted to the Orono or Portland campus in regular, four-year degree programs. The C.E.E.B. Scholastic Aptitude Test and three Achievement Tests are required.

II. Two-Year Associate Degree Program in Administration (Business or Public)—a terminal program. Candidates must have graduated from high school and must complete the C.E.E.B. Scholastic Aptitude Test.

III. Two-Year Associate Degree Program in General Education—a terminal program. Candidates must meet the same requirements as for II above.

ADMISSION OF SPECIAL AND SHORT COURSE STUDENTS

In exceptional cases, and when space permits, a mature person who presents satisfactory evidence of ability to benefit from work of a special college program may be admitted to the University as a special student. Such students are not candidates for degrees but will be registered in the college where the principal courses in their program are taught. Application forms may be obtained from the Director of Admissions.

ADMISSION TO THE CONTINUING EDUCATION COURSES ADMINISTERED BY THE DIVISION OF PUBLIC SERVICES

The University of Maine has undertaken a broadened program of adult education at various locations throughout Maine. This program includes credit courses, non-credit courses, short courses, and conferences as appropriate.

The categories of admission under the programs in Continuing Education are:

1. Degree Program Admission—Regular admission requirements are in effect for both undergraduate and graduate degree applicants. Applications should be filed with the Director of Admissions (undergraduate degree status) or with the Dean of the Graduate Division.
2. Deferred Degree Program—An undergraduate-trial program with a specific 30-hour program planned to give a candidate an opportunity to prove his capabilities to continue as a degree candidate.
3. Special Student Admission—For students who are not candidates for degree credit, but who are qualified, according to University standards and regulations, to enroll in selected courses.

Information and application forms may be obtained by writing the Director, Continuing Education, Merrill Hall, University of Maine, Orono, Maine 04473.

FORMER STUDENTS

Former students who desire to return to the University must file an early application for re-admission with the Director of Admissions. The applicant must arrange for official transcripts and catalogs to be forwarded to the Director of Admissions from all schools and colleges attended since leaving the University of Maine. Application forms may be obtained from the Director of Admissions.

The request for readmission by a former student is reviewed and acted upon by the Committee on Academic Standing.

UNIVERSITY OF MAINE

ADMISSION BY TRANSFER

The admission of transfer students is necessarily carefully controlled. Admission is on a selective basis.

A student desiring to transfer to the University of Maine from another college of recognized standing must file an early application with the Director of Admissions—at least five months prior to the semester he plans to enter. This request must include a statement of the name and address of all schools and colleges attended as well as information indicating the desired curriculum.

The applicant must arrange for official transcripts and catalogs to be forwarded from all previously attended junior colleges, colleges, and universities to the Director of Admissions, Wingate Hall, University of Maine, Orono, Maine 04473. Students who have been dismissed from another college for any reason are not eligible for consideration for one year.

The evaluation of transcripts of academic work completed at institutions previously attended must be accepted as final at the time of enrollment.

NEW ENGLAND REGIONAL COOPERATION

New England's six state universities are working together to increase the number and variety of educational opportunities for the young people of the region. Under this new cooperative program, qualified New England residents are given preferential admission at other state universities in certain specialized programs not available at their own state university. Students accepted in these programs are also granted the benefit of in-state or resident tuition and fees which are considerably lower than those usually charged out-of-state students. This plan makes available to the residents of the region a wider variety of programs at low cost—without additional funds being spent to duplicate specialized staff and expensive facilities in each state.

Each university has designated which of its programs are to be offered on a regional basis and maintains control over its own courses and programs. The undergraduate programs begin at the freshman level. Other regional programs are available at the graduate level or for certain pofessional curricula.

Information may be obtained from high school guidance officials, from the New England Board of Higher Education, 20 Walnut St., Wellesley, Mass., 02181; or by writing to the directors of admission at the six New England state universities.

The New England Association of Colleges and Secondary Schools accredits schools and colleges in the six New England states. Membership in one of the six regional accrediting associations in the United States indicates that the school or college has been carefully evaluated and found to meet standards agreed upon by qualified educators. Colleges support the efforts of public school and community officials to have their secondary school meet the standards of membership.

Financial Information

STUDENT EXPENSES

The student expenses outlined in the following paragraphs are the anticipated charges for the academic year 1969-70. Changing costs may require an adjustment of these charges.

Tuition and Fees for the Academic Year*

Regular Students	Residents of Maine	Non-Residents of Maine
Tuition	$400.00	$1,000.00

Estimate of Student Expenses

A partial list of necessary expenses for a semester is indicated below. It includes only items which are fairly uniform for all students.

Rates for One Semester	Residents of Maine	Non-Residents of Maine
Tuition	$200.00	$500.00
Board and Room (University Dormitories)	475.00	475.00
	$675.00	$975.00

Textbooks, personal laboratory equipment, etc., are not furnished by the University and are estimated to cost from $90 to $160 per year.

A *student fee* for the support of student governmental organizations is now levied by the University and is incorporated in the semester bills.

The University has arranged to provide a student health and accident insurance plan on an optional basis for a premium of $25 for 12 months following fall registration. The insurance is routinely charged to every fully enrolled student on the fall semester bill; if it is not desired the student must so notify the Treasurer's Office at the time of registration.

Matriculation Fee—This fee of $25 is required of all students registering for the first time who are candidates for a degree. It must be paid as part of the first term bill.

Payment of Bills—All University bills, including those for rooms and board in University buildings, are due and payable on or before registration day for each semester. An academic year consists of two semesters, fall and spring.

Installment Program—Students whose circumstances are such that payment of their semester bills in full at the time of registration would work a real hardship will be permitted to use the following schedule:

* Please see catalog sections on University of Maine, Augusta for charges at that campus.

Fall Semester

½ the total semester charge at registration
⅙ the total semester charge on October 1
⅙ the total semester charge on November 1
⅙ the total semester charge on December 1

Spring Semester

½ the total semester charge at registration
⅙ the total semester charge on March 1
⅙ the total semester charge on April 1
⅙ the total semester charge on May 1

For the 1969-70 academic year no extra assessment will be made to students using the above deferment schedule, but if it is found that too many take advantage of its provisions it will become necessary in the future to make a service charge for its use. This installment program is not available for charges totalling less than $198 for the semester. The priviledge of using this program will be withdrawn if payments are not made promptly as scheduled.

Freshman Charges—The following table shows the fixed charges for the fall semester for freshmen:

	Residents of Maine	Non-Residents of Maine
Tuition	$200.00	$500.00
Room and Board (University Dormitories)*	475.00	475.00
Freshman Orientation Period**	18.00	18.00
Matriculation Fee	25.00	25.00
	$718.00	$1018.00

For freshmen who do not room and board in University dormitories, the charge is $243 for residents of Maine and $543 for non-residents.

For the graduate students and students classified as "special," and for those registered for less than a normal program, the rate will be $22·($50 for non-residents) per semester hour up to 10 semester hours. *Full tuition is charged all students registered for 10 or more semester hours.*

All fully-enrolled students may avail themselves of the services provided by the University Health Service. Students registered for 10 or more semester hours are admitted without charge to athletic events and the Concert Series. Generally students registered for less than 10 hours may purchase tickets for these events.

Room and Board—Due to the difficulty of estimating the cost of food, fuel, and services, it is impossible to guarantee the exact cost of room and board. The charge for room and board in the permanent dormitories for the fall semester, 1969, is $475. The charge for room and board in Hannibal Hamlin Hall for the fall semester, 1969, is $425.

* See statement under Room and Board.

** Maximum (may vary according to room and board provided)

In the cooperative dormitories for women, the charge for room and board is based upon student effort in management and operation, and is at less than regular rates.

A women's dormitory fee of $15 per semester is charged to all women students living in University dormitories (except Colvin Hall). This is necessitated by the higher cost of security measures resulting from a vote by women students for new curfew rules.

All University dormitories are closed to students during scheduled vacation periods.

Miscellaneous—A fee of $10 is charged a student who registers after the prescribed day of registration.

The prescribed gymnasium uniform for women costs approximately $25. Information regarding the uniform and where it may be purchased will be sent to incoming students during the summer.

Tuition fees for work taken in the Continuing Education Division are at the rate of $22 per credit hour, except as indicated otherwise in the Continuing Education bulletin.

The fees for students registered in Applied Courses in Music are indicated in the catalog section on Music.

Deposits—A deposit of $25 is due when the applicant is notified of acceptance by the Director of Admissions. If a dormitory room is required, an additional $25 is due. These deposits will be applied toward the student's account when he registers. (They should not be confused with the matriculation fee of $25, which is a non-refundable charge.)

If a freshman, transfer, or readmission applicant notifies the Director of Admissions of withdrawal prior to June 1, the deposits will be refunded. *The deposits are forfeited in case of withdrawal after June 1.*

All upperclassmen desiring to live in a dormitory must pay a room deposit of $25 during the spring in order to assure that rooms will be reserved for them in the fall. This deposit will be deducted from the fall semester bill. If it is found that dormitory accommodations are not desired the deposit will be refunded if the Housing Office is notified by August 1. If notice is not given by that date the deposit will be forfeited.

Locks for gymnasium lockers may be secured from the Physical Education Department and must be returned at the end of the spring semester. No deposit is required, but a charge of $2.50 is made if the lock is not returned at the end of the year.

Refunds—Students leaving the University before the end of a semester will receive refunds correlated with the Installment Program. Tuition and room payment refunds will be paid as follows:

Fall Semester

Withdrawal	before October	1 — ½ of semester charge
	before November	1 — ⅓ of semester charge
	before December	1 — ⅙ of semester charge

Spring Semester

Withdrawal	before March	1 — ½ of semester charge
	before April	1 — ⅓ of semester charge
	before May	1 — ⅙ of semester charge

A board refund, approximately the cost of raw food, will be made for each day remaining in the semester.

Summer Forestry Camp—The charges for Summer Forestry Camp (near Princeton, Maine) described in the catalog section on Forestry are:

	Resident	Non-Resident
Tuition	$176.00	$400.00

Room and board and course fee for Fy 19 S are assessed in addition to the above charges.

Rules Governing Residence

A student is classified as a resident or a non-resident for tuition purposes at the time he is admitted to the University. The decision, to be made by the treasurer, is based upon information furnished by the student and any other relevant information. In general, in order to be considered eligible to register as a resident a student must have established a bona fide year-round residence in the State of Maine with the intention of continuing to maintain it indefinitely. The tuition status as determined at the time of enrollment normally prevails as long as the student remains in attendance. Members of the Armed Forces and their dependents are normally granted in-state tuition rates during the period when they are on active duty within the State of Maine.

Subject to the provisions of the preceding paragraph, the residence of an unmarried minor follows that of the parents or legally appointed guardian. The bona fide year-round residence of the father, if living, otherwise that of the mother, is the residence of such a minor; but if the father and the mother have separate places of residence, the minor takes the residence of the parent with whom he lives or to whom he has been assigned by court order. If neither of the parents is living the unmarried minor takes the residence of his legally appointed guardian.

Subject to the provisions of the first paragraph above, an adult student, defined for purposes of these rules as one who is either married or 21 years of age or older, will be classified as a resident of Maine if (1) his parents are residents of Maine and he has not acquired residence in another state; or (2) being at least 21 years old, he has resided in Maine for at least six consecutive months immediately preceding his initial admission to the program of his choice.

The residence of a wife follows that of her husband; however, a woman student who already has a resident status by reason of the residence of her parents, or by reason of her own residence where she is at least 21 years old, may continue as a resident student although she marries a non-resident.

In all cases the University reserves the right to make the final decision as to resident status for tuition purposes.

Communications

Communications with reference to financial affairs of students should be addressed to the Treasurer of the University of Maine. Matters concerning all types of financial assistance should be referred to the Director of Student Aid.

STUDENT AID

The Student Aid Program is designed to help students with financial problems who have shown themselves willing to help themselves, who have done creditable academic work, who are of good character, and who can be expected to be a credit to themselves and their University.

The Student Aid Program for all campuses of the University is administered through the Office of Student Aid and includes the following activities: 1) part-time employment; 2) student loans; 3) scholarships; 4) special living arrangements (University Cabins and Colvin Hall); 5) the Work-Study Program of the Economic Opportunity Act; 6) and Educational Opportunity grants of the Higher Education Act of 1965.

A complete description of the many facets of the program of financial assistance to students at the University has been published in a separate bulletin, entitled Financial Aid. Entering students may obtain a copy by writing to the Director of Admissions, Wingate Hall. Students currently in attendance at any of the University campuses, or interested parents, may obtain a copy by writing to the Office of Student Aid. The publication also presents the latest available information on the federal student assistance programs participated in by the University. All programs of financial assistance are equally applicable to each campus of the University if the student is approved and registered in a degree-type program.

The University administers and/or holds the following loan, scholarship and prize funds. A complete description of each fund is given in the special Financial Aid bulletin. Scholarship funds for the Graduate School are listed in the Graduate School Catalog.

LOAN FUNDS

The AAUW Loan Fund
The Jacob Agger Loan Fund
The American Institute of Electrical Engineers Loan Fund
The William E. Barrows Loan Fund
The Henry N. Berry III Law Student Loan Fund
The O. Merrill Bixby Loan Fund
The Boston Alumnae Fund
Katherine M. and Walter H. Bragg Fund*
The Carleton Orchard Fund
The Gordon L. Chapman Loan Fund
The Class of 1907 Loan Fund
The Class of 1913 Loan Fund
The Class of 1914 Loan Fund
The Class of 1931 Loan Fund
The Class of 1932 Loan Fund
The Class of 1933 Loan Fund
The Class of 1935 Loan Fund
The Class of 1936 Loan Fund
The Class of 1939 Loan Fund
The Class of 1944 Loan Fund
The Frederick W. Conlogue Loan Fund
The Cumberland County Alumni Association Student Loan Fund
The Charles D. Darling Jr. Memorial Fund

The George P. Davenport Student Loan Fund
The Delta Chi Alpha Loan Fund
The Delta Delta Delta Loan Fund
The Robert W. DeWolfe Fund*
The Drummond Fund
The Esther Eayres Chapter, Daughters of American Revolution Loan Fund
Harry A. Emery (Maine 1906) Fund*
The Thomas G. Feltman-John E. Field, Jr. Loan Fund
The John Fils Memorial Fund
The Maine State Florists Association Loan Fund
The Ralph E. Fraser Loan Fund
The General Loan Fund
The Henry Fairfield Hamilton Loan Fund
The J. Dudley Harrington Loan Fund
The Maynard A. Hincks Memorial Fund
The Chester A. Jenkins Loan Fund
The Kappa Psi Loan Fund
The John Fitzgerald Kennedy Memorial Loan Fund
The Francis Gregory King Memorial Loan Fund
The Kittredge Fund
The H. Walter Leavitt Loan Fund
A.D.T. Libby Loan Fund
The Philip W. Lown Loan Fund
The Maine Alumni Association of Boston Loan Fund
The Maine Alumni Teachers Association Loan Fund
The Maine Association of Engineers Loan Fund
The Maine Campus Fund
The Mrs. Maine Club Loan Fund
The Leslie E. Norwood Loan Fund
The Ralph Packard Loan Fund
The Charles H. Payson Loan Fund
The Phi Eta Kappa Loan Fund
The Pulp and Paper Foundation Loan Fund
The Schiro Family Loan Fund
The Senior Skull Loan Fund
The Sigma Chi Loan Fund
The Mary S. Snow Memorial Loan Fund
The Southern New Hampshire Alumni Loan Fund
The Bertha Joy Thompson Loan Fund
The George W. Treat Fund
The Ernest A. Turner Loan Fund
The Diong Diek Uong Loan Fund
The Wheelden-Bassett Fund
The Frances D. Young Loan Fund
(*-In University of Maine Foundation)

SCHOLARSHIPS

Trustee Undergraduate Tuition Scholarships

The Merritt Caldwell Fernald Scholarship
The James Stacy Stevens Scholarship
The Harold Sherburne Boardman Scholarship
The Leon Stephen Merrill Scholarship
The Charles Davidson Scholarship
The College of Business Administration Scholarship
The University of Maine in Portland Scholarship
The University of Maine School of Law Scholarship
The John Homer Huddilston Scholarship
The Rising Lake Morrow Scholarship
The Maine State Colleges Scholarships
The University Indian Scholarships
The University Scholarships
The Foreign Student Scholarships
The Science Scholarships

Endowed Scholarships

Albert E. Anderson Class of 1909 (Law) Fund

The Appreciation Scholarship Fund
The Robert I. Ashman Fund
The Kenneth and Marjorie C. Baird Scholarship Fund
The Bancroft and Martin Scholarship Fund
The Bangor Business and Professional Women's Scholarship Fund
The Bangor Daily News Scholarship Fund
The Israel Bernstein Memorial Scholarship for School of Law
The Harold H. Beverage Award Fund
Myra Baker Bickford Scholarship Fund
William Bingham, 2nd, Scholarships
William Bingham, 2nd Scholarships in Honor of Payson Smith
James H. Boody Scholarship Fund
The William E. Bowler Scholarship Fund
The Geraldine Brewster Scholarship Endowment Fund
The Edgar W. Brigham Scholarship Fund
The Adelaide G. Bunker Educational Fund
Lillian Abbott Butterfield Citizenship Fund
Harold M. Carr Scholarship Fund
The Class of 1905 Scholarship
The Class of 1940 Student Emergency Fund
The Class of 1926 Scholarship Fund
The Class of 1941 Memorial Fund
The Class of 1943 Student Aid Fund
The Class of 1954 Scholarship
The Class of 1957 Scholarship
The Class of 1961 Scholarship
The Class of 1962 Scholarship
The Class of 1968 David R. Rittenhouse Scholarship Fund
The Albert D. Conley Fund
The Donald P. and Franceila D. Corbet Fund
The Walter Joseph Creamer Fund
The Oliver Crosby Scholarship Fund
The Harold R. Cummings Scholarship Fund
The Mabel and Mary Daveis Fund
The Frank Conant Day Fund
The C. Walton Deckelman Memorial Fund
The Delta Delta Delta-Frances Kent Murray Scholarship
The Arthur Lowell Deering Fund
The Charles Alexius Dickinson Scholarship Fund
Richard C. Dolloff Scholarship Fund
The Charles Leslie and Helen H. Eastman Scholarship Fund
E. Perrin Edmunds Scholarship Fund
The Lloyd H. and Evelyn E. Elliott Scholarship Fund
The Joseph and Mollie Emple Scholarship Fund
The Rachel W. Engel Scholarship Fund
The Harry H. and Ida E. Epstein Scholarship Fund
The Fred S. N. Erskine Scholarship Fund
Round Top Farms Scholarship Fund
The Joseph Rider Farrington Scholarship
The Edward Files Scholarship Fund
The John P. Fitch Scholarship Fund
The Deacon Ephraim Flint Scholarship Fund
The Fort Kent Future Farmers Scholarship Fund
The Ella Somerville Foster Scholarship
The Harold F. French Fund
The Salomie and Eulalia Gardner Fund

The Mary French Geyer Scholarship Fund
The Fred H. and Alice V. Gould Scholarship Fund
The Henry L. Griffin Scholarship Fund
The Eugene Hale Scholarship Fund
Allen Crosby Hardison Scholarship Fund
The Helen C. Hardison Scholarship Fund
The Alonzo J. Harriman Scholarship Fund
The Elise R. Hatch Memorial Fund
The Philip R. Hathorne Scholarship
The Helen B. Hemingway Memorial Fund
The Lillie C. Hemphill Scholarship Fund
The Benjamin Higer Memorial Scholarship Fund
The Frededick W. and Marianne Hill Scholarships
The Linnie P. Hills Fund
The Kenneth W. Hodgdon Fund
The David Dunlap Holmes Scholarship Fund
The Hovey Memorial Scholarships
The Will R. Howard Scholarship Fund
Mary L. Hoyt Mathematics Memorial Fund
The Carol C. Jones Scholarship
The Max Kagan Family Foundation Scholarship Fund
The Kidder Scholarship
The Spoffard H. Kimball Scholarship Fund
The Charles E. Knowlton Fund
The Mac and Lillian Lacritz Scholarship Fund
The Fred L. Lamoreau Scholarship Fund
The Ralph W. Leavitt, Sr., Scholarship Fund
The Limestone Future Farmers Scholarship Fund
The Maine Extension Association Scholarship Fund
The Thomas G. Mangan Scholarship Fund
The John L. McCobb Scholarship Fund
The Marguerite E. McQuaide Scholarship Fund
The Rebecca and Benjamin Mendelson Memorial Scholarship Fund
The Marion Farrington Merritt Memorial Fund
The Philip I. Milliken Fund
The Alma Taylor Milne Fund
The Calvin H. Nealley Scholarships
The Gilbert Crosby Paine Scholarship
The Edward E. Palmer Scholarship
The Perley Burnham Palmer Scholarship Fund
The William Emery Parker Scholarship
The Clifford Spruance Patch Scholarship Fund
The Jean Spruance Patch Fund
The William N. Patten Scholarship Fund
The Charles H. Payson Scholarships
The Ralph H. Pearson Fund
The Stanley Plummer Scholarship
The Portland Junior College Fund
The Frank P. Preti Scholarship Fund
The Frederick G. Quincy Scholarship Fund
The Henri Raffy Memorial Fund
The Samuel and Pauline Rudman Scholarship Fund
The Herbert Sargent Student Aid Fund
The Arthur E. Silver Scholarship Fund
The Leroy C. Smith Scholarship Fund
J. Robert Smyth Scholarship Fund
The Mary S. Snow Memorial Fund
The Frank Elwyn Southard Fund

The Adelbert W. and Irene K. Sprague Scholarship Fund
The Anne E. Stodder Scholarship Fund
The James and Sarah Striar Scholarship Fund
Richard F. Talbot Scholarship Fund
The Bertha Joy Thompson Scholarship Fund
The James E. Totman Fund
The Nathan Pratt Towne Scholarship Fund
The University Store Company Scholarship Fund
The Mary Maxfield Valentine Memorial Scholarship
The Sergeant Walter McClymonds Wales Scholarship Fund
The Donald S. Walker Scholarship Fund
The Charles P. Weston Scholarship Fund
The Mott F. Wilson Scholarship Fund
The Gerald E. Wing Scholarship Fund
The Julia E. Winslow Scholarship Fund
The Charles F. Woodman Fund

Annual Scholarships

The Agricultural Club Scholarship
All-Maine Women Scholarship
The American Can Company Foundation Scholarship
The Army ROTC Scholarships
The Associated Women Students Scholarship
The Augusta Chapter, AAUW Scholarship
The Elizabeth Abbott Balentine Scholarships
The Bates and Rogers Foundation Scholarships
Bath Iron Works Corporation Scholarships
Carl Beyer Law Student Grant
The Boston Paper Trade Association Scholarships
The Louis Calder Foundation Scholarships
The Class of 1960 Scholarship
The Charles M. Cox Trust Fund Scholarship
The Geigy Dyestuffs Scholarship
The General Foods Fund Scholarships
The General Motors Scholarship
D. S. and R. H. Gottesman Foundation Scholarship (Spanish)
The Graduate "M" Club Scholarships
The Stanley D. Gray Scholarship Fund
The Great Atlantic and Pacific Tea Company Scholarship
The Martin Hagopian Scholarship
The Homelite Forestry Scholarship
The Charles H. Hood Dairy Foundation Scholarships
Mabel G. Kennedy Nursing Grant
Insurance Women of Southern Maine Scholarship
Rolland Irish Business Administration Grant
The Knox County Fish and Game Association Scholarship
The Knox-Lincoln County Women of Extension Scholarship
The Maine Bridge Association Scholarship Fund
The Maine Consumer Finance Association Tuition Scholarship
The Maine Life Scholarship
The Maine Managers' Scholarship
The Maine Section IEEE Award
The Maine Sub-Aqua Club, Inc. Scholarship
The Maine Vegetable Growers' Association Scholarship
The National Plant Food Institute Scholarship
The David M. Nelson Scholarship

The New England Farm and Garden Association Scholarships
New York Mercantile Exchange Scholarship
The Northeastern Division Paper Industry Management Association Scholarship
The Ober Award
The Velma K. Oliver Phi Kappa Phi Scholarship
The Paper Trade Journal Scholarship
The Penick and Ford Scholarship in Pulp and Paper Technology
The Pennsylvania, New Jersey, and Delaware Division of the Paper Industry Management Association Annual Scholarship Award
The Barbara Bosworth Scholarship of Phi Mu
The Pi Beta Phi Scholarship
The PIMA Award
The Pulp and Paper Foundation Scholarships
The Ralston Purina Scholarship
The Retail Lumber Dealers Association of Maine Scholarship
The Rice and Miller Company Scholarship Fund
The Harrison L. Richardson Scholarship
Lila and Vernon Segal Scholarship
The Senior Alumni Association Scholarships
The Senior Skull Scholarship
The Simmons Foundation Student Grant Program
The Carl R. and Laura Smith Scholarship
The Sophomore Owl Scholarship
The Dean John E. Stewart Scholarship
The Lucy Stone League Inc. Scholarship
The TAPPI-Maine, New Hampshire Section Annual Award
Oscar E. and Dorcas D. Taylor Annual Scholarship Fund
The Charles Irwin Travelli Scholarship Fund
The Joel J. and Annie H. Walker Scholarships
The Stanley M. Wallace Scholarship
A Western Electric Company Scholarship
The George D. Woodward Accounting Grant
The Beatrice Batchelder Wright Scholarship
The York County Poultry Improvement Association Scholarship
The Zonta Club of Bangor Scholarship
The Zonta Club of Portland Scholarship

Alumni Association Scholarships

The Androscoggin Valley Alumnae Scholarship
The Black Bear Club of Rhode Island Scholarship
The Eastern Pennsylvania Alumni Association Scholarship
The Massachusetts North Shore Alumni Association Scholarship
The Northern Connecticut Alumni Association Scholarship
The Portland Alumnae Association Scholarship
The Southern Connecticut Alumni Association Scholarship
The Southern Kennebec Maine Alumni Association Scholarship
The Southern Penobscot Alumnae Association Scholarship
The Western Pennsylvania Alumni Association Scholarship
The Worcester County, Massachusetts, Alumni Association Scholarship

UNIVERSITY OF MAINE FOUNDATION FUNDS

The Archie A. Adams Scholarship Fund
The Edwin Wentworth Adams Scholarship Fund

The Maria S. Appleton Fund
The Hazen H. Ayer Scholarship Fund
The Dr. Tibor Jalsoviczky Bebek Memorial Fund
The Hosea B. Buck Memorial Fund
Buxton-Hollis Community Hospital Fund, Inc.
The Ava H. Chadbourne Fund
The Elwood I. and Hazel P. Clapp Scholarship Fund
The James W. Clarkson Fund
Class of 1906 Fund
Class of 1909 Fund
Class of 1910 Trust Fund
Class of 1911 Scholarship Fund
Class of 1912 Fund
Class of 1915 Student Aid Fund
Class of 1916 Scholarship Fund
Class of 1917 Scholarship Fund
Class of 1918 Fund
Class of 1919 Fund
Class of 1920 Fund
Class of 1920 Scholarship Fund
Class of 1920 Scholarship Fund (S.A., Limited)
Class of 1921 Fund
Class of 1922 Fund
Class of 1923 Fund
Class of 1924 Fund
Class of 1925 Fund
Class of 1927 Fund
Class of 1928 Fund
Class of 1929 Student Aid Fund
Class of 1930 Fund
Class of 1937 Fund
Class of 1938 Students Aid Fund
Class of 1942 Fund
Class of 1945 Fund
Class of 1946 Fund
Class of 1947 Fund
Class of 1948 Fund
Class of 1949 Scholarship Fund
Class of 1950 Fund
Class of 1951 Fund
Class of 1952 Fund
Class of 1953 Grant-in-Aid Fund
Class of 1955 Fund
Class of 1956 Fund
Class of 1958 Scholarship
Class of 1959 Fund
Class of 1962 Sterritt Fund
Class of 1963 Fund
Arthur C. Clayton Horticultural Scholarship Fund
Charles E. Crossland Fund
C. Parker Crowell Fund
Eugene Danforth Scholarship Fund
The Robert W. DeWolfe Fund
Emma Jane Eaton Fund
James Adrian Gannett Scholarship Fund
Charles E. Gilbert Scholarship
George P. Gould & Antoinette G. Torrey Fund
Pearl R. Graffam Scholarship Fund
Greater New York Alumni Association Scholarship Fund
Lucy F. Griffin Fund
George E. Hamblen Fund
Robert C. Hamlet Fund
George O. Hamlin Fund
James Norris Hart Scholarship
Arthur A. Hauck Fund
President Hauck Scholarship Fund
Thelma L. Kellogg Fund
Benjamin C. Kent Fund
Harriet S. Kilby Scholarship
Harland A. Ladd Scholarship Fund
Nathan Levitan Scholarship Fund
Alfred B. Lingley Scholarship Fund
George E. Lord Scholarship Fund
Harold P. Marsh Fund
The Elsie C. Moody Scholarship Fund
Frank P. Morison Scholarship Fund
William A. Murray Fund
Penobscot Valley Alumni Association Scholarship
Thomas Allen Perkins Medical Fund
Harold M. Pierce Fund
Wesley C. Plumer Fund
James E. Poulin Fund
John Reed '89 Scholarship Fund
Rhode Island Alumni Association Scholarship

The William F. Scamman Scholarship Fund
Senior Alumni Scholarship Fund
Ben Sklar Scholarship Fund
Anna Strickland Fund
William Jordan Sweetser Fund
The Helen White Tobey Scholarship Fund
Christine Blaisdell Urann Fund
Viles Family Scholarship
Alburney E. Webber, Jr., Scholarship Fund
Ralph Whittier Fund
Dorothy H. and Arthur O. Willey Fund

University of Maine Pulp and Paper Foundation Funds

Philip S. Bolton Scholarship Fund
The Knud Dahl Scholarship Fund
The Samuel Dauman Scholarship Fund
The Frederick H. Frost Fund
The Paul Hodgdon Scholarship Fund
The Everett P. Ingalls Fund
The Manuel C. McDonald Scholarship Fund
The J. Larcom Ober Scholarship Fund
The George Olmsted Scholarship Fund
The Benjamin L. Sheldon Fund
The Elvah L. Soderberg Scholarship Fund
The Ralph A. Wilkins Scholarship Fund

PRIZES

Endowed Prizes and Awards

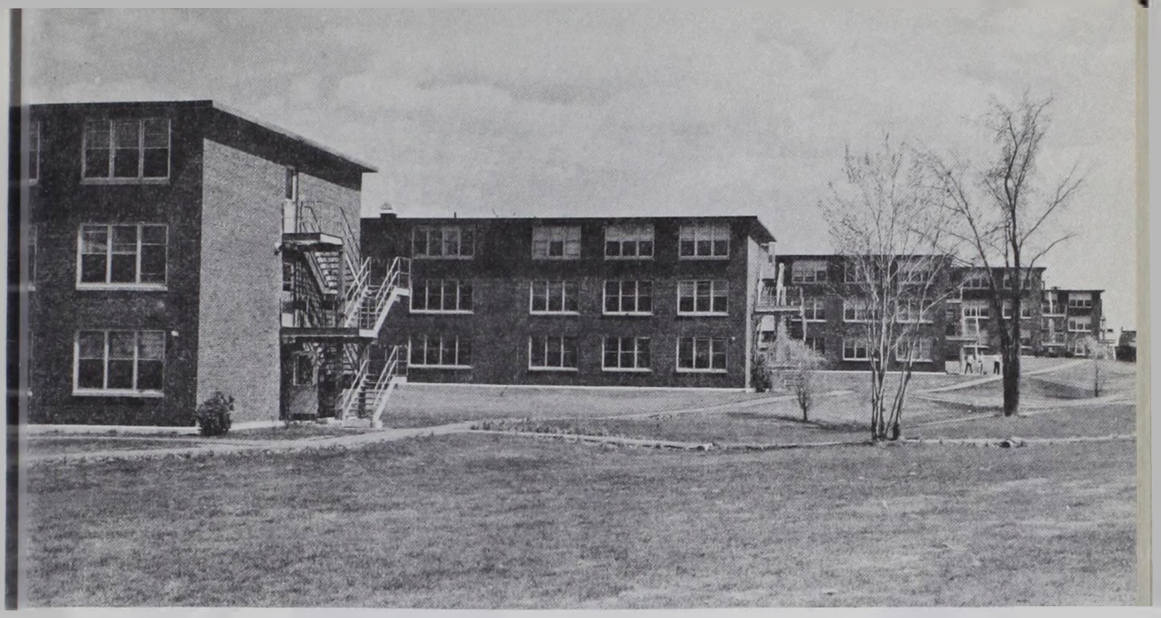
Frank B. Bickford and Charles S. Bickford Memorial Prize Fund
The Prize of the Class of 1873
The Milton Ellis Prize
The Claude Dewing Graton Prize
The Henry L. Griffin Prize in English Composition
The Maine Hardwood Association Award
The John M. Oak Scholarship Prizes
The John Ferdinand Steinmetz Memorial Award

Annual Prizes and Awards

The Chi Omega Prize
The Dorothy Stone Clark Memorial Prize
The Frank H. Dalton Award in Bacteriology
The Delta Zeta Prize in English
The Freshman Algebra Prizes
The Helen A. Lengyel Award
The Maine Association of Engineers Honor Award
The Carl Whitcomb Meinecke Award
The James Gordon Selwood Scholarships

The Panhellenic Scholarship Award
The Sigma Chi Foundation Scholarship Cup
The Interfraternity Singing Contest Trophy
The Charles Rice Cup
The Intramural Plaques

The Washington Alumni Association Watch
The Portland Alumnae Memorial Watch



UNIVERSITY OF MAINE, SOUTH CAMPUS

South Campus is located in Bangor, Maine, on a site which formerly housed Dow Air Force Base. Students enrolled in the two-year Associate Degree programs are housed at South Campus and take courses both at South Campus and at Orono, 10 miles away. Some students enrolled in four-year programs, to include transfers and readmissions, live at South Campus. Some faculty members in the Associate Degree Programs maintain offices on South Campus. However, four-year programs are conducted at Orono.

South Campus has dormitory and dining facilities, a gymnasium, student union, recreation and game building, and a theatre with a seating capacity to accommodate 500. Classes are held in Eastport Hall and in Caribou Hall.

There are 8 bowling lanes, billiard tables, and ping pong available in the Recreation Building. There are many intramural activities including a bowling league. The library is located in Eastport Hall.

A health service is maintained with a full-time registered nurse and a part-time physician during the day hours and an immediate call service available to the Orono Health Center at any time of the day or night. Students requiring short periods of hospitalization are taken care of in the newly completed Infirmary in Orono.

The Office of Student Aid and the Placement Bureau at Orono provide assistance to students at South Campus. Students should feel free to contact the Orono offices.

A Personnel Dean is available, in Bangor Hall, for consultation on a regular schedule. A Director of Religious Affairs is also available on a part-time basis in Dow Hall.

Resident counselors are available on every floor of every dormitory for counseling and are responsible for the general supervision of their building. In addition, every dormitory has a Head Counselor who is responsible for the resident counseling program. The Housing Office is located in Bangor Hall.

Students are encouraged to participate in all activities available at both the Orono and South Campuses.

Bus service is available on a regular schedule to transport students between the two campuses.

COLLEGE OF ARTS AND SCIENCES

JOHN J. NOLDE, DEAN

College of Arts and Sciences

The College of Arts and Sciences provides opportunities for students to acquire knowledge and skill in a variety of fields wherein a cultural emphasis is prominent.

The college is divided into 17 departments and a School of Nursing. All students are required to take work in several of these departments; but, in general, the degree of specialization can vary widely to fit the needs of individuals. Some students may desire to pursue studies in only a few of the major departments, while others may prefer to take work of greater subject-matter range. The college has prepared, for those who desire them, specific programs of study in many preprofessional and vocational fields (see the section on Specimen Curricula). Considerable flexibility is permitted the student within all these programs.

The college's major objective is to furnish its students with a general cultural background. Within the framework of this background the student will also find much that is of utilitarian value. The college seeks to train men and women in critical intelligence, broad and sympathetic understanding of human needs, and determination of purpose.

Arts and Sciences students who are interested in taking subjects offered in one of the other colleges of the University may do so provided they have fulfilled the necessary prerequisites. In collaboration with the College of Education, this college offers specialized training to prospective teachers.

GENERAL INFORMATION

Admission—The specific requirements for admission are given in full elsewhere in the catalog (see page 41). All deficiencies in entrance requirements must be made up before registering for the junior year. Students who transfer from other colleges with advanced standing must satisfy all admission requirements within a year.

Transfer Credit—No transfer credit will be allowed for courses taken at another institution in which grades below C have been received. Evaluation of courses taken at another accredited institution for which transfer credit is asked rests with the Director of Admissions and the Dean.

Graduation Requirements—The work of the College of Arts and Sciences leads to the degree of bachelor of arts (B.A.) and bachelor of science (B.S.). The latter degree is awarded in the School of Nursing. All students are required to complete a minimum of 120 degree hours.

In addition, each student must accumulate a total of "grade points" equal to 1.8 times (with the Class of 1973, 2.0 times) the number of credit hours in which he receives grades. In computing grade points, each credit hour of A is multiplied by 4, B by 3, C by 2, D by 1, and E by 0.

Specific course requirements are listed in the section, The First Two Years.

The passing of a comprehensive examination is a requirement for the degree in certain departments.

Satisfactory work in written English is required throughout the college course.

Students who transfer to this college from another college of the University will be required to do two full years' work in the College of Arts and Sciences and satisfy all specific requirements before receiving the bachelor of arts degree, with the exception that students from the College of Technology may transfer after the junior year and be graduated after one year's work as majors in the Departments of Physics, Chemistry, or Mathematics; and students from the College of Life Sciences and Agriculture may similarly transfer and be graduated as majors in the Department of Zoology.

The First Two Years—The emphasis in the first two years of the student's college course is on basic courses in varied fields. The objective is twofold: first, to enable the student to acquire wide knowledge; and second, to prepare him for advanced study in a major subject or field.

To meet these objectives, the college has established specific course requirements for the first two years. With the consent of the adviser and the dean, not more than two of these requirements may be postponed until the junior year by any student whose interests are best served by variation from the usual program. Also, the student may be able to satisfy certain of these requirements by passing qualifying tests. Permission of the department concerned must be obtained by the student before he attempts the test.

The course requirements follow:

I. ENGLISH and SPEECH. All freshmen are required to complete Eh 1, Freshman Composition and Eh 9 (or 10), Modern Literature, and Sh 1, Public Speaking.

II. FOREIGN LANGUAGE. All students except those in the School of Nursing are required to complete Intermediate French, German, Russian, Spanish, Greek, or Latin, or to pass a qualifying test in one of these languages. The intermediate course will normally be taken in the freshman year by those students who continue a language taken for at least three years in high school. Students who begin a language in college would normally take the intermediate course in the sophomore year.

III. SOCIAL SCIENCE. A minimum of two year-courses in social science is required of all students. Students who have not completed a basic one-year high school course in American history are required to take United States History (Hy 3. 4). During the first two years, students who have completed such a course in high school should select two of the following year-courses: Hy 3. 4, United States History, Hy 5. 6, History of Western Europe, My 1/2, Modern

Society, Ec 1/2, Principles of Economics, Pol 1/2, Introduction to Government, Ay 1/2, Introduction to Anthropology, Sy 3/4, Introduction to Sociology or Py 1/2, General Psychology. Hy 3. 4 and Hy 5. 6 may not be used in combination to satisfy this requirement, and also Ay 1/2 and Sy 3/4 may not be used in combination to satisfy this requirement.

IV. NATURAL SCIENCE AND MATHEMATICS. A minimum of two years of work in science is required of all students. One year of this work must be a basic year-course in laboratory science or mathematics, and work of the second year must be taken in a different subject matter area. Two of the semester courses in descriptive science may be used to satisfy one year of this requirement. With the approval of the dean certain other combinations may be allowed to fulfill the descriptive science combinations.

a. Basic year courses:
   As 15/16, General Astronomy
   Bt 1, General Botany, and Bt 2, The Plant Kingdom
   Ch 11/12, General Chemistry, or Ch 13/14, Chemical Principles
   Gy 1/2, Physical and Historical Geology
   Ms 4, Algebra and Trigonometry and Ms 12, Analytical Geometry and Calculus
   Ms 5/6, Elements of College Mathematics
   Ps 1/2, or Ps 1a/2a, General Physics
   Zo 3/4, Animal Biology
   Zo 3, Bt 1, Animal Biology and Botany
b. Semester courses in descriptive science:
   As 9, Descriptive Astronomy
   Gy 1a, Descriptive Geology, Physical
   Gy 2a, Descriptive Geology, Historical
   Ms 19, Principles of Statistical Inference
   Ps 3, Descriptive Physics

V. HUMANITIES. A year-course from the following is required: Hy 1. 2, Classical and Medieval Civilization, Pl 1. 2, Philosophy and Modern Life, Cp 11. 12, Western Tradition in Literature, and Cl 1. 2, Greek and Latin Literature in English Translation, and Hr 47. 48, Honors Group Tutorial for those students registered in the Honors Program.

VI. PHYSICAL EDUCATION. All students, except veterans, are required to take and pass one year of physical education.

Students may register for five courses (normally 14-17 hours), excluding Mt 1, 2, 3, or 4. Dean's List students may register for six courses (normally 18 hours).

Normally not more than six hours may be taken in one subject in either semester of the sophomore year.

The Last Two Years—On the completion of 53 degree hours, the student, in conference with his adviser and with the approval of the dean, selects his major subject. The department in which the major subject chiefly falls becomes for administrative purposes the student's major department, and the head of that department is responsible for the student before the faculty and must approve the student's registration.

The major curriculum is the nucleus of related courses selected by the student as representing his chief field of interest or major subject. Normally much of the work will fall in one department. The minimum number of credit hours acceptable for a major is set by the department. The maximum number of hours a student may count for degree credit from any one department is 48, including the credit derived from the introductory course in that department. (Not applicable in B.S. program).

Selected students may take advanced courses in Military Science and Tactics during their junior and senior years, for which a maximum of 10 credit hours may be received.

Comprehensive Examinations—Some departments of the college require comprehensive examinations of their senior major students. Certain departments also give basic preparatory comprehensives in the spring semester of the junior year. The comprehensive examination provides the student with an opportunity to demonstrate his knowledge of the salient features of his general field of study. It aims to make clear the unity of the field as a whole. It is designed to develop perspective and to encourage organization of materials, accuracy and range of knowledge. The student is thus able to evaluate his ability in the field of his major interest and to make a smooth transition to his professional and graduate work.

Foreign Study—The college encourages students in good academic standing to spend a year (preferably the junior year) in study at selected foreign universities. Depending on the foreign institution attended and the type of courses taken, academic credit for such study will be determined by the dean and the head of the student's major department upon completion of the program. While evidence of satisfactory performance in the form of grades, certificates, etc., is required to obtain degree credit, such grades will not be used in computing the student's accumulative average at the University of Maine.

Honors Program—These tutorial courses encourage exceptional ability by affording special opportunities for its exercise and to reward high achievement with appropriate recognition. The program stimulates originality, intellectual curiosity, and resourcefulness, and demands a large measure of self-reliance. The student does his work under the supervision of a tutor, whom he meets in conference at regular intervals for informal discussion and advice. The formal recognition, the highest offered in the College of Arts and Sciences, is conferred following a successful completion of the honors program, in the form of graduation honors of three grades: honors, high honors, highest honors.

Pass-Fail Option—Students enrolled in the College of Arts and Sciences who have achieved sophomore standing and who have an accumulative grade point average of 2.0 or better are eligible to take *one* course a semester on a Pass-Fail basis. However, courses which are required by the college and courses taken in one's major field or closely related fields may not be taken on a Pass-Fail basis.

Normally only the Registrar and the student's adviser will know which course the student is taking under the option. A student will be required to take all examinations and fulfill all other course requirements. The instructor sub-

mits a letter grade to the Registrar who converts the grade to either a Pass or Fail and enters it on the sudent's record.

A grade of D or better is graded as a Pass. Although Pass grades are not used in computing grade point averages, the credit thus earned is counted for degree credit.

Projects-in-Learning—Projects-in-Learning consists of two component programs which are experimental in nature, and designed to offer to qualified students an opportunity to explore in depth subjects not normally dealt with in the curriculum.

One program, Independent Study, is available to students with an accumulative point average of 2.5 or better and sophomore standing or above. Independent Study projects are arranged between instructor and student. An instructor helps the student shape a project and is available for guidance at all times; however, emphasis is on the word *independent* and the student is encouraged to work on his own. Independent study projects can be used to satisfy major requirements with the prior approval of the department head.

The second component is the Special Seminar Program. Each semester seminars dealing with topics not covered in depth in regular courses are offered to students who have an accumulative point average of 2.0 or better and have sophomore standing or above. Emphasis is placed on topics of concern to interested students and faculty and range from those dealing with contemporary social problems to those designed to explore the unusual and provocative. Examples of seminars recently offered are: "The Brain and the Computer" and "Contemporary Poetry." Special seminars do not satisfy any university, college or departmental requirements.

The Projects-in-Learning Program is directed by a supervisory committee which must approve all projects work. Students, faculty and administrators are encouraged to formulate and submit imaginative proposals to the committee which consists of four faculty members and four students.

Eligible students may take up to four "projects" in their last three years but no more than one each semester. All projects work is graded Pass or Fail.

Information regarding this program may be obtained from advisers and from the Dean's Office, 100 Stevens Hall.

Professional Certificates for Teachers—Certification for secondary school teaching may be earned by students registered in the College of Arts and Sciences. Eighteen hours of basic work (Ed B2, Ed B3, Ed B4, one methods course and student teaching) meets the professional subject requirements for the General Secondary Provisional Certificate, which must be renewed after five years. Student teaching is required for full certification.

In addition to the 18 hours in professional courses, completion of a teaching major of 30 hours in one academic subject commonly taught in secondary schools is required. Candidates for a certificate are also expected to complete at least 18 hours in a second teaching field.

An alternate route to certification is possible by having 50 hours in a teaching area where at least three related academic subjects are represented.

Among the combinations of subject fields expected of prospective teachers are mathematics and science, English and history, English and French, English

and Latin, history and Latin, history and French, French and Latin, English and speech, and history and speech.

Medical Technology—This course has been developed in cooperation with the Eastern Maine General Hospital, Bangor, the Central Maine General Hospital, Lewiston, and the Maine Medical Center, Portland. Students electing the program spend three or more years at the University of Maine following which they undergo a period of 12 months in training at one of the above hospitals. Students receive the degree of bachelor of arts when they have satisfactorily completed the program (see page 70) and the certificate in medical technology when they have passed a special examination. The work at the University also meets the entrance requirements of schools of medical technology which are not affiliated with the University.

Public Management Curriculum—This program is designed to train men and women for governmental service in towns and cities.

Bangor Theological Seminary—Regularly enrolled students in the College of Arts and Sciences may register for courses at the Bangor Theological Seminary, not to exceed five credit hours per semester, without payment of additional fees. The College of Arts and Sciences extends a like privilege to students regularly enrolled at the Bangor Theological Seminary. Such registrations must have the approval of the academic deans of both institutions and the instructors involved. Credit for courses so taken will be considered a part of the student's program at the institution where he is enrolled.

While enrolled at the Bangor Theological Seminary a student may, with the approval of his dean and the admissions officer of the University, also register as a special student in the College of Arts and Sciences on the established fee basis for such courses. Work so taken, if it does not substitute for or duplicate courses taken in the seminary program, may be counted as advanced standing credit toward the degree in the event a student later registers for a degree program at the University.

Summer Session—Before students of the College of Arts and Sciences pursue Summer Session courses in any institution other than the University, they must secure the approval of the dean if they expect degree credit for such work. A marked bulletin of the institution should be left at the dean's office with a note requesting such credit for the courses selected.

Premedical and Predental Options—Medical and dental colleges in general desire students who are not only well prepared in the sciences and mathematics but who are also broadly educated. To the first point they require certain courses in biology, chemistry, mathematics and physics; to the second they recommend a liberal background in the humanities and the social sciences.

Although most premedical and predental students major in a science, they may major in any of the non-science departments according to their interests. The student would be advised, however, to take a program during the first two years that will allow the greatest possible freedom of choice in later selecting an undergraduating major. The freshman year specimen curricula given for majors in chemistry, physics or zoology will leave many options open. Those who major in a non-science department and meet only the minimum science and mathematics

requirements should achieve superior grades in order to demonstrate their proficiency in these critical subjects.

In order to achieve a uniformly strong program, all premedical and predental students are advised to take the following courses, regardless of their major:

		Subject	Credit Hours
Ch	13/14	Chemical Principles	8
Ch	140	Quantitative Analysis	4
*Ch	151/152	Organic Chemistry Lecture	6
*Ch	161/162	Organic Chemistry Laboratory	4
Bc	161	Physiological Chemistry	4
*Ms	4	Algebra and Trigonometry	4
*Ms	12	Analytic Geometry and Calculus	4
*Ps	1a/2a (or Ps 1/2)	General Physics	8
*Zo	3/4	Animal Biology	8
Zo	133	Comparative Anatomy	4
Zo	136	Developmental Biology	4
Zo	162	Principles of Genetics	3

* Required essentially by all medical schools.

Students should take speech, two years of a foreign language, preferably German, and psychology. They must also meet the special requirements of the college and the department in which they major.

SPECIMEN CURRICULUM FOR MEDICAL TECHNOLOGY

Freshman Year

FALL SEMESTER			Hours	SPRING SEMESTER			Hours
†Ch	13	Chemical Principles	4	†Ch	14	Chemical Principles	4
Eh	1	Freshman Composition or Eh 9, Modern Literature	3	Eh	1	Freshman Composition or Eh 10, Modern Literature	3
Pe	1	Physical Education	0	Pe	2	Physical Education	0
				Sh	1	Public Speaking	3
†Zo	3	Animal Biology	4	†Zo	4	Animal Biology	4
		Modern Language	3			Modern Language	3
			14				17

Sophomore Year

			Hours				Hours
†Bc	21	Organic Chemistry	4	†Bc	122	Biochemistry	4
Ms	4	Algebra and Trigonometry	3	Py	2	General Psychology	3
Py	1	General Psychology	3	†Zo	158	Animal Parasitology	4
†Zo	151	Histology	4			Modern Language or Social Science	3
		Modern Language or Social Science	3			Elective	3
			17				17

Junior Year

			Hours				Hours
†By	127	General Bacteriology	5	†By	152	Pathogenic Bacteriology	4
†Ch	140	Quantitative Analysis	4	Cp	12	Comparative Literature	3
Cp	11	Comparative Literature	3			Social Science	3
Ps	3	Descriptive Physics	3			Electives	4
		Social Science	3				
			18				14

*Senior Year

Twelve months in either the Eastern Maine General Hospital, Bangor, Maine; the Central Maine General Hospital, Lewiston, Maine; or the Maine Medical Center, Portland, Maine.

	Weeks	No. of credits
†Microbiology (Bacteriology, Parasitology, Mycology)	12	7
†Clinical Biochemistry	12	7
†Clinical Microscopy (urine, feces, spinal fluid)	4	3
†Hematology	11	6
†Blood Bank Procedures	4	3
†Serology	4	3
†Histologic Technique	4	3
†Electrocardiography	1	0
Total	51	32

* Students desiring to spend their senior year at the University of Maine may do so by electing the proper advanced courses along with a departmental major other than medical technology. Such students are candidates for the bachelor's degree in the major fields of their choice. They are eligible for the certificate of M.T. only upon completion of a fifth year of training, this to be obtained at a hospital laboratory.

† These courses, or their equivalents, are required for the major in medical technology.

SPECIMEN CURRICULUM IN PUBLIC MANAGEMENT

Leading to

Degree of B.A. in Public Management

Freshman Year

FALL SEMESTER			Hours	SPRING SEMESTER			Hours
Eh	1	Freshman Composition or Eh 9, Modern Literature	3	Eh	1	Freshman Composition or Eh 10, Modern Literature	3
Ms	5	Elements of College Math	3	Ms	6	Elements of College Math	3
Pe	1	Physical Education	0	Pe	2	Physical Education	0
Pol	1	Intro. to Government	3	Pol	2	Intro. to Government	3
Sy	3	Intro. to Sociology	3	Sh	1	Public Speaking	3
		Language	3	Sy	4	Intro. to Sociology	3
						Language	3
			15				15

Sophomore Year

			Hours				Hours
Ec	1	Principles of Economics	3	Ec	2	Principles of Economics	3
Pol	3	State Government	3	Pol	158	Public Opinion	3
		Humanities	3			Humanities	3
		Language	3			Language	3
		Science	3			Science	3
			15				15

Junior Year

(Common to Federal-State and Local Options)

			Hours				Hours
Ba	9	Prin. of Accounting I	3	Ba	10	Prin. of Accounting II	3
Ba	161	Personnel Management	3	Ms	19	Prin. of Stat. Inference	3
Pol	144	Public Relations	2	Ms	169	Computer Programming	3
Pol	151	Public Administration	3	Pol	152	Administrative Law	3
Ec	171	Public Finance		Ec	172	Public Finance	
or				or			
Sw	150	Social Welfare	3	Sw	151	Social Welfare	3
			14				15

Senior Year—Federal-State Option

			Hours				Hours
Pol	156	Political Parties	3	-or-			
Pol	159	Problems of American Government	3	Pol	160	Problems of State Government	3
Pol	183	Constitutional Law	3	Pol	184	Constitutional Law	3
Pol	297	Seminar	3	Pol	298	Seminar	3
		Electives	3-5			Electives	6-8
			15-17				15-17

Senior Year—Local Option

			Hours				Hours
Pol	133	The American City	3	Pol	134	Municipal Administration	3
Pol	297	Seminar	3	†Pol	195	Internship	3
		Electives	9	Pol	200	City & Regional Planning	3
				Pol	298	Seminar	3
						Electives	4-5
			15				16-17

Recommended Electives

Ec	171	Public Finance		Ec	172	Public Finance	
or				or			
Sw	150	Social Welfare	3	Sw	151	Social Welfare	3
Pol	7	Maine Government	1	Sy	126	Socio1. of Urban Life	3
Pol	183	Constitutional Law	3	Pol	8	Maine Government	1
Eg	1	Technical Drawing	2	Pol	184	Constitutional Law	3
Ce	5	Surveying	3	Ce	10	Curves & Earthwork	2
Ce	29	Intro. to Highway Eng.	3	Ce	30	Transportation Engineering	3
Ce	31	Intro. to Sanitary Eng.	3	Ce	32	Sanitary Eng. Design	3

† Internship to be included as part of spring registration but the training taken in twelve weeks of the summer at end of junior year.

SPECIMEN CURRICULUM FOR ZOOLOGY, PREMEDICAL, AND PREDENTAL MAJORS

Freshman Year

FALL SEMESTER			Hours	SPRING SEMESTER			Hours
Eh	1	Freshman Composition or Eh 9, Modern Literature	3	Eh	1	Freshman Composition or Eh 10, Modern Literature	3
Ms	4	Algebra & Trig.	3	Ms	12	Anal. Geometry and Calculus	4
Pe	1	Physical Education	0	Pe	2	Physical Education	0
Zo	3	Animal Biology	4	Zo	4	Animal Biology	4
		*Modern Foreign Lang.	3			Modern Foreign Language	3
		Social Science	3			Social Science	3
			16				17

Sophomore Year

			Hours				Hours
Ch	13	Chemical Principles	4	Ch	14	Chemical Principles	4
Sh	1	Public Speaking	3	Zo	136	Development Biology	4
Zo	133	Comparative Anatomy	4	Ms	19	Statistics	3
		Modern Foreign Lang.	3			Modern Foreign Language	4
		Social Science	3			Social Science	3
			17				17

Junior Year

			Hours				Hours
Ch	151	Organic Chemistry	3	Ch	152	Organic Chemistry	3
Ch	161	Organic Chemistry Lab	2	Ch	162	Organic Chemistry Lab	2
Ps	1a	General Physics	4	Ps	2a	General Physics	4
Zo	177	Animal Physiology	4	Zo	162	Prin. of Genetics	3
		Humanities	3			Elective	3
						Humanities	3
			16				18

Senior Year

			Hours				Hours
Ch	140	Quantitative Analysis	4	Zo	178	General Physiology	4
Zo	151	Histology	4			Zoology Elective	4
		Zoology Elective	4			Elective	9
		Elective	5				
			17				17

* The equivalent of two years of collegiate modern foreign language, preferably German, is usually required for medical school admission. Candidates should be familiar with the specific requirements of several schools before planning their first-year program. Those who have a special interest in chemistry should take Ch 13/14, Chemical Principles, with or without Animal Biology in the freshman year.

COURSES OF INSTRUCTION

Courses numbered 1 to 99 are undergraduate courses. They are open to graduate students but credit earned in these courses may not be used to satisfy advanced degree requirements. Courses numbered 100 to 199 are upperclass undergraduate courses which may be used for graduate degree credit by graduate students if given prior approval by the graduate students' advisory committee. Courses numbered 200 to 299 are graduate courses which may be elected by undergraduate honor students, or those undergraduates whose advancement in the field will permit their taking a graduate level course among graduate students without disadvantage to themselves. Courses numbered 300 to 399 are graduate level courses which may be taken only by students admitted to the Graduate School.

One number is used for a course which is given both fall and spring.

When a dash is used between the two numbers (e.g., 1-2), both semesters must be taken to obtain credit; when a slant is used (e.g., 1/2), the first semester may be taken by itself, but the second cannot be taken unless the first is taken previously; when a period is used (e.g., 1.2), either semester may be taken for credit.

Courses offered in 1970-71 and alternate years are indicated by the sign (†) *placed before the number of the course; courses offered in 1969-70 and alternate years are indicated by the sign* (‡) *placed before the number of the course.*

ANTHROPOLOGY (Ay)

PROFESSORS EMERICK, IVES; ASSISTANT PROFESSORS ACHESON, TUMARKIN; INSTRUCTOR PEARSON:

The Department of Anthropology presents a program of study designed to expand the student's awareness and understanding of the biocultural nature of man, the variousness of his behavior and the structure and function of his institutions. It is also designed to acquaint the student with the fundamental concepts and principles as well as the basic research skills of the disciplines for which the department is responsible—anthropology (cultural, physical, linguistics, social anthropology, archaeology) and folklore.

The undergraduate major in the department may select and develop, in consultation with his adviser, a basic curriculum (or a series of courses) which will give him an opportunity to develop his interests and provide him with the background necessary for his future needs. In addition to the following, students in the department must meet the general requirements of the College of Arts and Sciences.

Specific requirements for majors:

Introduction to Anthropology (Ay 1/2), Introduction to Sociology (Sy 3), Principles of Statistical Inference (Ms 19) or its equivalent as agreed upon by the department through the major adviser, Ethnographic Method (Ay 120) and Ethnological Theory (Ay 161). Including the above majors may take a minimum of 36 and a maximum of 48 hours within the department. Any Fo course counts as major credit as well as up to 12 hours in collateral areas such as sociology, social welfare, psychology, economics, history, political science, geology, and zoology. Major

credit in specific collateral courses is granted only by departmental approval through the major adviser.

Recommended laboratory science courses for anthropology majors are Principles of Geology (Gy 1/2), or Animal Biology (Zo 3/4). For those students who have not taken Gy 1/2 as a lab science, Descriptive Geology (Gy 1a/2a) is recommended to meet the Arts and Sciences descriptive science requirements. Other recommended electives are General Psychology (Py 1/2), Social Psychology (Py 130), Comparative Anatomy (Zo 133), Glacial Geology (Gy 152), and Pleistocene Epoch (Gy 342).

The two introductory courses, Ay 1/2 and Sy 3, should be taken during the freshman or sophomore year and may be taken concurrently. Fo 1 and Fo 2 may be taken during the freshman or sophomore years. Any two of the following Fo courses may be counted toward an English major: Fo 1, Fo 2, Fo 134, and Fo 179.

Students who wish to explore the requirements for graduate study or the professional or career aspects of any of the areas for which this department is responsible should consult with their departmental advisers.

Specimen curriculum in Anthropology

The anthropology major is required to take Introduction to Anthropology (Ay 1/2), Introduction to Sociology (Sy 3), Principles of Statistical Inference (Ms 19) or its equivalent, Ethnographic Method (Ay 120), and Ethnological Theory (Ay 161).

Freshman Year

Ay	1	Introduction to Anthropology	Ay	2	Introduction to Anthropology
Sy	3	Introduction to Sociology	Sy	4	Introduction to Sociology
Eh	1	Freshman Composition	Eh	1	Freshman Composition
		or Eh 9, Modern Literature			or Eh 10, Modern Literature
Fr	3	(or Gm 3) Intermediate French	Fr	4	(or Gm 4) Intermediate French
		or Intermediate German			or Intermediate German
Pe	1	Physical Education	Pe	2	Physical Education
Zo	3	Animal Biology, or Ms 5,	Sh	1	Funds. Public Speaking
		Elements of College	Zo	4	Animal Biology, or Ms 6,
		Mathematics			Elements of College
					Mathematics

Sophomore Year

Py	1	General Psychology	Py	2	General Psychology
Ay	1	Introduction to Anthropology	Ay	2	Introduction to Anthropology
		or Sy 3, Introduction to			or Sy 4, Introduction to
		Sociology			Sociology
		Foreign Language, if not			Foreign Language, if not
		completed in freshman year			completed in freshman year
		Humanities course			Humanities course

Recommended electives: Py 1/2, General Psychology; Ec 1/2, Principles of Economics; Pol 1/2, Introduction to Government; Gy 1/2, Principles of Geology; Gy 1a, Descriptive Geology, Physical; and/or Gy 2a, Descriptive Geology, Historical; and Zo 133, Comparative Anatomy.

UNIVERSITY OF MAINE

Students who major in the Department of Anthropology will establish, in consultation with their major adviser, the program for their junior and senior years. Consult this catalog for specific courses, and for department requirements concerning advanced courses.

Anthropology (Ay)

1/2. Introduction to Anthropology—The development of man as a bio-cultural phenomenon. Special emphasis on human paleontology and race formation as well as on the nature of culture and such human institutions as social organization, marriage, religion, economics, etc., among primitive people, with some application of derived principles to Western civilization. Required of majors. *Cr* 3. MR. EMERICK

120. Ethnographic Method—A study of methods and techniques in ethnography, including an introductory survey of some of the methodological issues involved in planning and carrying out field studies. Emphasis is on the ethnographer's way of looking at and making a record of human behavior. Ay 1/2 or permission. *Cr* 3. (Spring semester) MRS. TUMARKIN

138. Race and Culture Conflict—Analysis of causal factors in group conflict, with emphasis on the problem of minority groups and non-Western people in culture contact situations. Prerequisite: Ay 1/2, or permission of the instructor. *Cr* 3. MR. EMERICK

139. Culture and Personality—A study of how culture influences the development of personality. Major emphasis is on the different ways in which human societies socialize the child and on the relationships between cultural systems and personality systems. Prerequisite: Ay 1/2 or permission of instructor. *Cr* 3. MR. EMERICK

141. People and Cultures of the Pacific Islands—The problem of migration to and the peopling of the Pacific world will be examined. The development of distinct cultural traditions traced in Australia, Melanesia, Micronesia, and Polynesia. The possibility of trans-Pacific contact with pre-Columbian America will be discussed, as well as the special problems of these Oceanic people in the modern world. Prerequisite: Ay 1/2, or permission of instructor. *Cr* 3. MR. EMERICK

143. Peoples and Cultures of South Asia—A descriptive and analytical survey of both the island cultures and the mainland cultures of South Asia. Selected representative groups from India, Ceylon, Assam, Burma, Thailand, Laos, Cambodia, and Viet Nam will be considered and discussed as well as those from Indonesia, Maylasia, and the Philippine Islands. Attention will be focused on traditional cultural characteristics but their relationship to current problems will also be considered. Ay 1/2 or permission of instructor. *Cr* 3. STAFF

144. Cultures and Societies of North and East Asia—A description and analysis of the people and cultural behavior of North and East Asia with special emphasis on China, Japan, and Korea. Particular attention will be given to cultural geography and population as well as to such topics as kinship and family, values and religion, political organization, economics and stratification of society. Trends in the contemporary life of these areas will be referred to, but current problems will be subordinated to insight into basic cultural patterns. Ay 1/2 or permission of instructor. *Cr* 3. STAFF

150. Hunters and Food Gatherers—A survey of the vanishing people whose subsistence economy has remained at the hunting and gathering level. Attention will be focused on selected groups in all major geographical and culture areas Both unique and common problems of these people will be dealt with and special emphasis will be placed on ethnohistorical, environmental, and acculturation factors. Prerequisite: Ay 1/2, or permission of instructor. *Cr* 3. MR. EMERICK

151. North American Indian Ethnology—A survey of the ethnology of the North American Indian from the southern edge of the Eskimo area to northern Mexico. Emphasis upon cross-cultural comparison through the use of specific ethnographic studies. The formulation of generalizations of geographical and temporal significance. Prerequisite: Ay 1/2, or permission of the instructor. *Cr* 3. MRS. TUMARKIN

152. Central and South American Indian Ethnology—A survey of the ethnology of Central and South American Indian cultures including the West Indies but excluding contemporary peasant societies. Designed as a sequence course to Ay 151 and using the same approach. Prerequisite: Ay 1/2, or permission of the instructor. *Cr* 3. MRS. TUMARKIN

153. People and Cultures of Mesoamerica—Study of contemporary peasant societies of Mexico and Guatemala. Short history of these communities since the Spanish Conquest. Comparison of Mestizo and Indian communities, relations between folk societies and urban areas. Special emphasis on current theory concerning Middle American societies. Prerequisite: Ay 2 or permission of the instructor. *Cr* 3. MR. ACHESON

154. Cultures and Societies of the Middle East—A study of the cultures and societies of the Middle East with emphasis on the Arab World, Turkey, Iran and Afghanistan. Particular emphasis will be given to religious organization, kinship, political organization, and economics. Special attention on contemporary life and the current problems in the ethnography. Ay 1/2 or permission of instructor. *Cr* 3. MR. ACHESON

155. Peoples and Cultures of Africa—Study of selected societies of Africa. The culture areas of Africa. Emphasis will be placed on an intensive study of societies in differing areas which exhibit important structural principles. Prerequisite: Ay 2 or permission of the instructor. *Cr* 3. MR. ACHESON

156. Islamic Africa—A study of the Muslim peoples and cultures of the Northern and Western parts of Africa. Contrast and comparison of the tribes of the Atlas, the coastal Arabs, the tribes of the Sahara, and tribes of West Africa dominated by Islam. Relationships between Islamic and pagan peoples. The city, village and tribe. Ay 1/2 or permission. *Cr* 3. MR. ACHESON

160. Peoples and Cultures of the Circumpolar Area—The development of northern cultures in both the Old and the New Worlds will be traced from prehistoric times to the present. Problems of economics, social structure, and cultural organization will be emphasized. Prerequisite: Ay 1/2, or permission of instructor. *Cr* 3. MR. EMERICK

161. Ethnological Theory—A survey of the main schools of theory (evolutionary, historical, functional) as they have developed and played their part in the history of anthropology. Using illustrations drawn from the literature, attention will also be given to current thought regarding social structure, particularly in the area of kinship, and an integrated body of definitions will be provided. Prerequisite: Ay 1/2 or permission. *Cr* 3. (Spring semester) MRS. TUMARKIN

163. Social Anthropology—Basic concepts, principles and problems of modern social anthropology will be presented through the reading of certain key monographs. Prerequisite: Ay 2 or permission of the instructor. *Cr* 3.
MR. ACHESON

165. Political Anthropology—Examination of leadership patterns for social control in selected non-Western and/or tribal societies. Prerequisite: Ay 2 or permission of the instructor. *Cr* 3. MR. ACHESON

166. Economic Anthropology—Comparative study of production, consumption and exchange in selected non-Western societies. Emphasis will be placed on factors influencing economic decisions in a variety of social and cultural settings. Prerequisite: Ay 2 or permission of the instructor. *Cr* 3. MR. ACHESON

167. Peasant Societies—Peasants, neither primitive nor modern, are the majority of humanity. Study of the similarities and differences among and between peasant societies in various parts of the world. A critical examination of the theory concerning peasantry. Prerequisite: Ay 2 or permission of the instructor. *Cr* 3. MR. ACHESON

170. Archaeological Theory and Method—An introduction to the methods of archaeological research. Techniques of excavation and analysis; theoretical basis of methods and fundamental principles; application to specific case studies; interpretation of findings; the use of geological, biological, geographical and other tools in archaeological research. Prerequisite: Ay 1/2 or permission of the instructor. *Cr* 3. MR. PEARSON

171. Old World Prehistory—The prehistory of man in the eastern hemisphere from the beginnings of culture through the development of agriculture and urbanism. The development and elaboration of human society as inferred from material remains. Prerequisite: Ay 1/2, or permission of the instructor. *Cr* 3. MR. PEARSON

172. North American Prehistory—The prehistory of man in North America from his arrival to European contact. A survey of major developments such as the spread of agriculture. Emphasis upon late and post-glacial adaptations to environment. Prerequisite: Ay 1/2, or permission of the instructor. *Cr* 3.
MR. PEARSON

173. Mesoamerican Prehistory—The prehistory of man in Mesoamerica, covering the area from northern Mexico to the Isthmus of Panama. The development of agriculture and urbanism with reference to parallel developments in the Old World. The emergence of civilization leading up to European contact. Prerequisite: Ay 1/2, or permission of the instructor. *Cr* 3. MR. PEARSON

177. Field Research in Archaeology—Introduction to archaeological field technics by excavation of prehistoric sites in Maine. Intensive training in site survey excavation technics, recording, analysis and preliminary interpretation of archaeological materials. Prerequisites: Ay 1 and 2 (or equivalent) and permission of instructor. *Cr* 3-6. STAFF

180. Anthropological Linguistics—The study of the structure and function of language as an aspect of culture. Specific emphasis is on the languages of the non-western world. Prerequisite: Ay 1/2 or permission. *Cr* 3. MRS. TUMARKIN

181. Language and Culture—This course is designed to explore the relationship between languages and the cultures of which they are a part. Study begins with an introduction to the writings of key figures in the field and goes on to ex-

plore their broader implications in such areas as kinship, primitive classification and semantics generally. Prerequisite: Ay 1/2 or permission. *Cr* 3.

MRS. TUMARKIN

197/198. Department Projects—For the advanced student. Minimum of 15 hours of department courses as a prerequisite. Apply directly to Professor Emerick before registration. *Cr* 2 or 3.

Folklore (Fo)

1. Introduction to Folklore—A survey of the various forms of music and poetry as they exist in folk tradition: epics, ballads, lyrics, work-songs, dance and play-party songs, blues, religious songs, etc. Emphasis will be on listening to field recordings. *Cr* 3, *Lec* 2, *Lab* 2. (Fall semester) MR. IVES

2. Introduction to Folklore—Survey of the different genres of folklore, with emphasis on belief, custom, and legend. *Cr* 3, *Lec* 3. (Spring semester)

MR. IVES

106. North American Indian Mythology—Myths, tales, and legends of selected representative American Indian groups of the United States and Canada, with special emphasis on the Northeast. Prerequisite: Fo 2 or permission of the instructor. *Cr* 3, *Lec* 3. (Spring semester) MR. IVES

107. Field Work in Folklore—Principles and methods of collecting songs, ballads, tales, beliefs, proverbs, oral history, and other data relevant to the study of folklore. Problem statement, advance preparation, interviewing techniques, the use of questionnaires, documentation, transcription, legal and ethical aspects, etc. Special attention given to the proper use of recording equipment. Readings, lectures, and practical field experience. Prerequisite: 3 credits of folklore or permission of instructor. *Cr* 3. MR. IVES

108. Poet and Performer in a Folk Culture—A study of the creation, performance, transmission, and function of poetry and other works of art in folk culture. Tradition and individual creativity: their limits, conflict, and resolution in a number of specific cultures. The theories of such men as Gummere, Boas Barry, Herzog, Merriam, and Parry and Lord. The general emphasis will be on the place of art and the artist in society. Prerequisite: 3 credits of folklore or permission of instructor. *Cr* 3. MR. IVES

134. Folksong in America—Types and traditions of folksong in America, especially the ballad; English, Scottish, Irish, Spanish, French, and Negro materials. Prerequisite: Fo 1 or permission. *Cr* 3, *Lec* 2, *Lab* 2. (Spring semester) MR. IVES

179. Folk Narratives—A study of the folktale (*Marchen*) and such allied forms as jests, tall tales, and various types of hero cycles found in both the Old and the New World. Prerequisite: Fo 2 or permission of the instructor. *Cr* 3. (Fall semester) MR. IVES

191. Projects in Folklore—Individual supervised projects particularly in the field of collecting folk materials. Prerequisite: 6 credits of folklore and permission of the instructor. *Cr* 2 or 3. (Fall semester) MR. IVES

ART (At)

PROFESSOR HARTGEN; ASSISTANT PROFESSORS DECKER, GHIZ, LEWIS;
INSTRUCTOR GREENWALD

As a division of the College of Arts and Sciences, the curriculum in Art is basically liberal arts, with required courses in the sciences, social studies, languages and humanities dispersed within the student's courses in art appreciation, history, aesthetics and studio. The art program offers a balance between creative studio experience in drawing, painting, graphics and design on the one hand, and lecture and seminar classes in history, criticism and appreciation on the other. Both directions of study may subsequently lead the student toward specialized work in the fine arts, industrial design, advertising, illustration, etc.; or to an advanced degree in research, history, or criticism. No advanced degrees in art are offered at this time. The department designates a minimum of 38 hours and a maximum of 48 hours within its program for the bachelor of arts degree.

The Department of Art, in Carnegie Hall, is adequately equipped with a large collection of slides, reproductions, artifacts and original works of art, all of which are available to the art student. Also, some seven or eight exhibitions of original art, in all media, styles and periods, are brought to the campus each month and displayed in the University's several art galleries. These shows offer the art major a first-hand opportunity to study and evaluate important masterpieces.

Majors in art education follow a curriculum developed in cooperation with the College of Education, leading to the bachelor of science degree in education. Preparation for elementary and secondary level teaching of art is offered here. Registration is in the College of Education.

SPECIMEN CURRICULUM FOR ART

Freshman Year

Eh	1	Freshman Comp. or Eh. 9, Modern Literature 3	Eh	1	Freshman Comp. or Eh. 10, Modern Literature 3
		Descriptive Science or Sh. 1, Fundamentals of Public Speaking 3-4			Descriptive Science or Sh. 1, Fundamentals of Public Speaking 3-4
		Foreign Language 1 3			Foreign Language 2 3
At	5	*Appreciation & History of Art 3	At	6	*Appreciation & History of Art 3
Pe	1	(1w) Phys. Ed. 0	Pe	2	(2w) Phys. Ed. 0
Hy	5	History of Western Europe or Social Science 3	Hy	6	History of Western Europe or or Social Science 3
		15-16			15-16

Sophomore Year

		Foreign Language 3 3			Foreign Language 4 3
		Social Science 1 3			Social Science 2 3
At	1	*Basic Drawing 2	At	2	*Basic Drawing 2
		Laboratory Science 3-4			Laboratory Science 3-4
At	7	*Basic Design 2	At	8	*Basic Design 2
		Electives 2-3			Electives 2-3
		15-17			15-17

Junior Year

		Humanities requirement I ...3			Humanities requirement 2 ...3
At	11	*Advanced Drawing 2	At	12	*Advanced Drawing 2
At	9	*Advanced Design 2	At	10	*Advanced Design 2
At	25	*Renaissance Art in Italy or At. 27 North. Renaissance Art 2	At	26	*Renaissance Art in Italy or At. 28 Northern Renaissance Art 2
At	21	*Amer. Art or At. 23 Cont. Art Forms 2	At	22	*American Art or At 24 Cont. Art Forms 2
		Electives 3-4			Electives 3-4
		14-15			14-15

Senior Year

At	15	*Painting & Rendering 2	At	16	*Painting & Rendering 2
At	23	*Cont. Art Forms or At 21 *American Art.....2	At	24	*Contemporary Art Forms or At 22 *American Art 2
At	19	Art in the Community or At 31, Masterpieces of Graphic Arts 2	At	20	Art in the Community or At 32, Masterpieces of Graphic Arts 2
At	97	Problems in Art 2-3	At	30	Art Materials & Techniques ...3
		Electives 6	At	98	Problems in Art 2-3
					Elective 3
		14-15			14-15

* Minimum required art courses for degree. Note: 38-hour minimum in art.

1/2. Basic Drawing—Fundamentals of drawing. Principles of perspective, shades and shadows, and composition. Pencil, charcoal, graphite, and crayon. *Lab* 4, *Cr* 2. STAFF

3. 4. Principles of Art—The basic principles of art—its substance, nature, and classifications. An analysis of architectural, sculptural, and pictorial forms. Not a historic study of art, although masterpieces are studied. *Rec* 2, *Cr* 2.

MR. HARTGEN

5. 6. Art Appreciation and History—Techniques and trends in architecture, sculpture, and painting as related to the history of art from the earliest times to the present day. Lectures, text, slides, and prints. *Rec* 3, *Cr* 3.

MR. HARTGEN

7/8. Basic Design—Fundamentals of design through studio experience. Blockprinting, silk screening, clay modeling, plaster casting, papier mache, posters, wire sculpture. Two and three dimensional design problems. *Lab* 4, *Cr* 2. MR. DECKER

9/10. Advanced Design—Advanced work in design problems using design experiences introduced in basic course. Two and three dimensional problems carried into layout, graphics, fabrics, etc. Prerequisite: At 1/2 or At 7/8. *Lab* 4, *Cr* 2. MR. DECKER

11/12. Advanced Drawing—Advanced studies in form, space, composition, and cast drawing. Field trips for outdoor sketching and painting. Development from charcoal to watercolor painting. Prerequisite: At 1/2. *Lab* 4, *Cr* 2.

MR. LEWIS

13. 14. Fundamentals of Painting—Basic introductions to the painting art. Exercises in color, technique, and composition. Studio and outdoor subjects.

All media. Prerequisite: At 1/2 or permission. (Not open to art majors) *Lab* 4, *Cr* 2. STAFF

15/16. Painting and Rendering—Studio studies and landscape painting with emphasis on composition, palette and techniques. Problems using pastel, sepia, watercolor, acrylics, and oil. Prerequisite: At 11/12. *Lab* 4, *Cr* 2. STAFF

19. 20. Art in the Community—The place of art in everyday life. First semester deals with the residence, school, church, civic architecture and city planning; second semester, industrial design, fashions, advertising, related subjects. *Rec* 2, *Cr* 2. MR. DECKER

21. 22. American Art—American painting, architecture and sculpture; styles, trends and schools. First semester, from beginning to 20th century; second semester, the 20th century. *Rec* 2, *Cr* 2. MR. DECKER

23. 24. Contemporary Art Forms—An examination of all modern European and American trends in architecture, sculpture, painting, and the graphic arts. A comparison of the modern "isms." At 5 and 6 are recommended but not required. *Rec* 2, *Cr* 2. MR. GHIZ

25. 26. Renaissance Art in Italy—The architecture, sculpture and painting of the Italian Renaissance from the 13th to 18th century. First semester: Rome and Florence; the second: Bologna, Venice, and Milan. At 5 and 6 recommended or permission. *Rec* 2, *Cr* 2. STAFF

27. 28. The Northern Renaissance—Architecture, sculpture and painting in Flanders, France, Germany, Spain, Holland, England from the 14th to 18th century. At 5 and 6 recommended or permission. *Rec* 2, *Cr* 2. MR. GHIZ

30. Art Materials and Techniques—Materials, methods, and techniques for the professional artist-craftsman. Examination, comparison, and testing of materials and processes of painting, graphics, sculpture, etc. Prerequisite: At 1/2 or permission. *Rec* 2, *Lab* 1, *Cr* 3. MR. DECKER

31. 32. Masterpieces of Graphic Arts—Drawings and prints, their techniques and classifications. Collecting, marketing and exhibiting. Masterpieces of all ages and countries. Study of original examples from the collection. *Rec* 2, *Cr* 2. STAFF

41/42. Commercial Art and Publications Design—The design of booklets, catalogs, magazines, newspapers, posters, etc. Exercises in lettering and layout. Prerequisite: At 1/2 or permission. *Lab* 4, *Cr* 2. (Given on sufficient demand.) MR. GHIZ

65. 66. Methods and Curricula in Art Education—Contemporary objectives in the teaching of art in the elementary and secondary schools. Selection and planning of materials, techniques, and curricula. Fall: elementary; spring: secondary. *Rec* 2, *Lab* 1, *Cr* 3. Permission of instructor. MR. LEWIS

69. The Teaching of Art—Current methods and materials for the teaching of art in the elementary grades. Theory and actual experience with various two and three dimensional art projects. *Lec* and *Lab* 3, *Cr* 2. MR. LEWIS

97. 98. Problems in Art—Advanced projects for student research and presentation. Undergraduate thesis or exhibition. *Cr Ar*. Permission of head of the department. STAFF

151. Art Education Workshop and Laboratory—Plan of study, projects and credit arranged. STAFF

CHEMISTRY (Ch)

PROFESSORS WOLFHAGEN, BEAMESDERFER, DOUGLASS, DUNLAP;
ASSOCIATE PROFESSORS GEORGITIS, GOODFRIEND, GREEN;
ASSISTANT PROFESSORS BENTLEY, PATIN, PATTERSON, RASAIAH, RUSS;
RESEARCH ASSOCIATE HILL; MRS. WHITNEY, MRS. WOLFHAGEN

The student majoring in chemistry in the College of Arts and Sciences is able to complete all requirements for certification to the American Chemical Society Committee on Professional Training. Chemistry majors who intend to enter medicine or other related fields are permitted to take fewer chemistry courses in order to have a wider choice of electives. Some variation in the order of electives as described below is possible in special situations.

Although the specimen curriculum below suggests beginning with Ms 4, the Department of Chemistry strongly recommends sufficient high school preparation in mathematics so that Ms 12 may be taken during the first semester of the freshman year. Further, a course in computer programming is recommended.

Courses in the Department of Chemistry are described under the College of Technology.

RECOMMENDED SPECIMEN CURRICULUM IN CHEMISTRY FOR STUDENTS IN THE COLLEGE OF ARTS AND SCIENCES

Freshman Year

FALL SEMESTER			Hours	SPRING SEMESTER			Hours
Ch	13	Chemical Principles	4	Ch	14	Chemical Principles	4
Eh	1	Freshman Composition or		Eh	1	Freshman Composition or	
Eh	9	Modern Literature	3	Eh	10	Modern Literature	3
Ms	4	Algebra and Trigonometry	3	Ms	12	Anal. Geometry and Calculus	4
Ps 1 or 1a		General Physics	4	Ps 2 or 2a		General Physics	4
Pe	1	Physical Education	0	Pe	2	Physical Education	0
			14				15

Sophomore Year

			Hours				Hours
Ch	140	Quantitative Analysis	4	Ch	152	Organic Chemistry Lecture	3
Ch	151	Organic Chemistry Lecture	3	Ch	162	Organic Chemistry Laboratory	2
Ch	161	Organic Chemistry Laboratory	2	Gm	2	Elementary German	3
Gm	1	Elementary German	3	Ms	28	Anal. Geometry and Calculus	4
Ms	27	Anal. Geometry and Calculus	4	Sh	1	Public Speaking	3
			16				15

Junior Year

FALL SEMESTER			Hours
Ch	171	Physical Chemistry	5
Gm	13	Inter. Scientific German	3
*Ms	29	Differential Equations	4
		Humanities or Social Science Elective	3
		Free Elective	3
			18

SPRING SEMESTER			Hours
Ch	172	Physical Chemistry	5
*Ch	190	Intermediate Organic Chemistry Laboratory	3
Gm	14	Readings in Scientific German (Intermediate)	3
		Humanities or Social Science Elective	3
		Free Elective	3
			17

Senior Year

			Hours
Ch	154	Adv. Inorganic Chemistry	3
*Ch	185	Chemical Literature	2
		Social Science or Humanities Electives	6
		Free Elective	3-6
			14-17

			Hours
*Ch	164	Instrumental Analysis	4
		Social Science or Humanities Electives	6
		Free Electives	6
			16

* For American Chemical Society Certification

COMPARATIVE LITERATURE (Cp)

PROFESSORS TERRELL, HUNTING, MOODY, AND O'NEILL; ASSOCIATE PROFESSORS COLBATH, JACOBS, ROGGENBAUER, TATEM, AND TREDWELL.

The college provides an interdisciplinary major in Comparative Literature, with offerings in the Departments of Art, English, Foreign Languages and Classics, History, Music, Philosophy, and Speech. Students with special interests in the cultural movements of Western civilization are invited to elect this major. The humanities requirement may be satisfied by two semesters taken seriatim from Eh 21, 22, 23, 24. Other requirements are: 1) at least 24 hours of Comparative Literature courses, and 2) 24 hours of related courses in the cooperating departments. During the senior year, majors must pass final examinations in 1) the history, 2) literature, and 3) either the philosophies or the arts (painting, sculpture, music, theatre) of one of the following periods of European civilization:

1. Greek and Roman Classicism (beginnings to 500 A.D.)
2. Medievalism (500-1300)
3. The Renaissance and Reformation (1300-1650)
4. Neoclassicism and the Enlightenment (1650-1785)
5. European Romanticism (1785-1850)
6. The Later Nineteenth Century (1850-1914)
7. The Twentieth Century (1914-present)

Information may be obtained from the Comparative Literature Office, 225 Stevens Hall.

Undergraduate Courses in Comparative Literature (Cp)

11. 12. The Western Tradition in Literature—A general survey of the major writers in the Western literary tradition, with particular attention to the development of our cultural heritage and the evolution of major literary forms. First semester: Homer to the Renaissance. Second semester: the 17th, 18th, and 19th centuries. *Cr* 3. MR. MANLOVE, Chairman

41. 42. The Drama of the Western World—A rapid survey from the beginnings to the present. Primary emphasis on literary forms and aesthetic values. Aeschylus to Ibsen the first semester; Ibsen to the present the second. *Cr* 3.

173. Earlier Criticism—From Plato to Coleridge. Includes readings of selected classics and practice in criticizing works of literature. *Cr* 3. MR. SPRAGUE

174. Modern Literature Criticism—From Coleridge to the present. Modern trends in criticism. *Cr* 3. MR. ANDERSEN

175. 176. European Literature—Continental European literature in translation. From Homer to the Renaissance in the first semester. Continuing to the present in the second semester. Prerequisite: Cp 11.12 or equivalent. *Cr* 3.

185. Earlier Biography—Great biographies of the world, from Plutarch to Boswell. *Cr* 3. MR. RANDEL

186. Modern Biography—Great biographies of the world, from Boswell to the present. *Cr* 3. MR. RANDEL

189. 190. Novel of Western Europe—A survey of the novel in France, Germany, Italy, and Spain. First semester from the beginnings to 1900. Second semester from 1900 to the present. *Cr* 3. MR. TERRELL

191. Early 20th Century Drama of the Western World—A study of such major dramatists as Ibsen, Strindberg, Pirandello, Shaw, O'Neill, and Maxwell Anderson. *Cr* 3. MR. TERRELL

192. Later 20th Century Drama of the Western World—A study of such major dramatists as Brecht, Anouilh, Giraudoux, Williams, Miller, and Albee, and the Theatre of the Absurd, with Beckett, Ionesco, Genet, Pinter, etc. *Cr* 3. MR. TERRELL

193. 194. Novel of Eastern and Northern Europe—A survey of the Russian, Scandinavian, and Central European novel. First semester from the beginnings to Tolstoy; second semester from Tolstoy to Pasternak. *Cr* 3. MR. TERRELL

230. Oriental Masterpieces: The Near East—Selections from the literature of India, Iran, and the Arab countries. *Cr* 3.

231. Oriental Masterpieces: The Far East—Selections principally from the literature of China and Japan. *Cr* 3.

240. Neoclassic Drama in Europe—A study of such major dramatists of Italy, Spain, France, and Germany as Lope de Vega, Calderon, Corneille, Molière, and Racine. Prerequisite: 12 hours of courses in drama or consent of the instructor. *Cr* 3.

241. European Drama of the 18th Century — A study of such major dramatists of Italy, Spain, France, and Germany as Goldoni, Beaumarchais, Lessing, Goethe, Schiller, and Alfieri. Prerequisite: 12 hours of courses in drama or consent of the instructor. *Cr* 3.

242. European Drama from the Revolution to 1850—A study of such dramatists as Scribe, Hugo, Dumas *pere*, Dumas *file*, Griboydeov, Pushkin, Gogoi,

Labiche, and Sardou. Prerequisite: 13 hours of courses in drama or the consent of the instructor. *Cr* 3.

251. Epic Masterpieces of the Middle Ages—The Nibelungenlied, Heliand, Chanson de Roland, and the Cid will be studied, with attention also to legendary material of Celtic origin (*matière de Bretagne*). *Cr* 3. MR. ROGGENBAUER

253. Neoclassicism in Europe—The growth and decline of neoclassicism followed by the maturing of the French enlightenment and its manifestations in Germany, Italy, Spain, and England. Consent of the instructor. *Cr* 3.

299. Seminar in European Literature — Special studies in a particular period of European literature. Emphasis will be on the major authors of the several national literatures to show the cross currents of influence in literary forms, aesthetics, and ideas. The period to be studied will vary from semester to semester. Consent of the instructor. *Cr* 3.

350. Independent Reading in Comparative Literature — For advanced students who desire to explore a particular period or author by self-directed readings. By consent of the Comparative Literature Office only. *Cr* 3.

ECONOMICS (Ec)

PROFESSORS COUPE, DEVINO, HUQ, JOHNSON; ASSOCIATE PROFESSORS CLARK*, SAVAGE, TALLEY; ASSISTANT PROFESSORS BURKE, DUCHESNEAU, WILSON; GRADUATE ASSISTANTS CAREY, LAVERY, SMITH, WIHRY

The student majoring in economics in the College of Arts and Sciences must fulfill all the requirements of the college and also complete the following curriculum:

1. Core Requirements
   Ec 1/2 — Principles of Economics
   Ec 132 — Macroeconomics
   Ec 173 — Price Theory
   Ba 9 — Principles of Accounting I
   Ms 19 — Principles of Statistical Inference
2. Completion of at least 18 additional hours in economics (Ec) courses. However, no student will be granted degree credit for course work in business and economics in excess of 48 hours. Students planning to major in economics should complete Ec 1/2, Principles of Economics, no later than the sophomore year.

Courses in Economics

1/2. Principles of Economics—Analysis of the fundamental characteristics and institutions of modern economic society, including business and labor organization, national and international policies. *Cr* 3. STAFF

37. Comparative Economic Systems—The structures and operating principles of the major contemporary economic systems are examined and compared. Prerequisite: Ec 1/2. *Cr* 3. STAFF

132. Macroeconomics—An analysis of the basic forces that cause fluctuations in economic activity. The effects on employment, investment, and business firms are thoroughly treated. Stabilization proposals are examined and evaluated. Prerequisite: Ec 1/2. *Cr* 3. MR. SAVAGE

133/134. Labor Economics—A discussion of labor in an industrial society serves as background for an examination of the origins and structure of the labor movement, the theories of the labor movement, the theories of wages and labor's income, the process of collective bargaining in industrial relations, and the development of labor legislation and social security laws. Prerequisite: Ec 1/2. *Cr* 3.

135. History of Economic Thought—A survey of the development of basic economic principles and theories from pre-industrial times to the present. Major emphasis is on the Classical School (Smith, Ricardo, and Malthus) and its critics, the development of the Austrian School, the synthesis of Neo-Classicism, and the emergence of Macroeconomics. Prerequisite: Ec 1/2. *Cr* 3. MR. HUQ

138. Economic Development—The theories and practices of interregional and international economic development. Special attention is given to development problems of emerging nations. Prerequisite: Ec 1/2. *Cr* 3.
MR. WILSON, MR. BURKE

139/140. International Trade and Commercial Policy—The principles and practices of international trade and finance are thoroughly treated. Special emphasis is given to current trends in the international economy and to United States commercial policy. Prerequisite: Ec 1/2. *Cr* 3. MR. WILSON, MR. BURKE

153. 154. Money and Banking—The first semester involves an extensive examination of the operation and performance of the American banking and financial system. The second semester is devoted primarily to a detailed study of monetary theory and policy. In addition, debt management and present international monetary problems are discussed briefly. Prerequisite: Ec 1/2. *Cr* 3.
MR. TALLEY

168. Social Control of Business—Public policy toward business; government powers and private rights; government aids; regulation of competition and monopoly; public enterprise. Prerequisite: Ec 1/2. *Cr* 3. MR. DUCHESNEAU

171. Public Finance and Fiscal Policy—Public expenditure theory; principles of taxation; the federal budget and alternative budget policies; federal tax policy; fiscal policy for stabilization; federal debt. Prerequisite: Ec 1/2. *Cr* 3.
MR. WIHRY

172. State and Local Government Finance—Development of the federal system; fiscal performance; intergovernmental fiscal relations; state and local revenue systems; budgetary practices; state and local debt. Prerequisite: Ec 1/2. *Cr* 3. MR. WIHRY

173. Price Theory—Price, income, and employment theory as tools in the study of economics. Prerequisite: Ec 1/2. *Cr* 3. MR. HUQ

174. Economic Policy—Current economic problems on national and international levels. Prerequisite: Senior standing in B.A. Program in Economics, or permission. *Cr* 3. MR. JOHNSON

175. Industrial Organization—Emphasis is on determining the relationship between market structure, conduct and performance. Also, the development of a general analytical framework to permit an assessment of performance in existing markets. Finally, current public policy in this area is evaluated in the framework of the above analysis. Prerequisite: Ec 173. *Cr* 3. MR. DUCHESNEAU

180. Introduction to Mathematical Economics—Mathematics is used as a language in presenting concepts of economic theory. Prerequisite: Ec 132, 173; Ms 6 or 12. *Cr* 3. MR. COUPE

198. The Dollar in World Affairs—The U. S. dollar as an international money. Its use in U. S. financial policy and foreign relations. Factors governing the international value and strength of the dollar. Prerequisite: Ec 1/2. *Cr* 3.

STAFF

210. Micro-economic Theory — An examination of the development of modern economic analysis with regard to the consumer, the firm and market structures. Prerequisite: permission. *Cr* 3. MR. COUPE

211. Macro-economic Theory — An examination of the development of modern economic analysis with regard to employment, income distribution, and stabilization policies. Prerequisite: permission. *Cr* 3. MR. SAVAGE

212. 213. Economics Research Seminar—The study of research methodology in economics developed by critical analysis of specific student research problems. Prerequisite: permission. *Cr* 3. MR. HUQ

220. Monetary Theory and Policy—A review of the development of contemporary banking and monetary theory. Primary emphasis is given to an analysis of the effects of alternative monetary policies. Prerequisite: Ec 153. *Cr* 3.

MR. JOHNSON

221. Public Finance and Fiscal Policy—An analysis of the theories of taxation and government spending. The impact of borrowing and tax policies. Special emphasis is on the fiscal policies of government activity under differing general economic conditions. Prerequisite: Ec 171. *Cr* 3. MR. WIHRY

222. International Economic Theory and Policy—An analysis of major factors in international economic relations. Subjects discussed include patterns of international specialization, balance of international payments, foreign exchange, U.S. international commercial policy and foreign investments. Prerequisite: Ec 139. *Cr* 3. MR. WILSON

223. Seminar in Labor Economics—An examination of basic theories of the labor union movement, the attempts to formulate new approaches in wage theory, and the relationship of wages, prices, employment and economic growth. Discussion includes the role of a free labor union movement in modern society and appropriate public policy. Prerequisite: Ec 133. *Cr* 3.

225. Mathematical Economics — Advanced economic theory is presented mathematically. Prerequisite: Ec 180, 210, 211, or permission. *Cr* 3.

MR. COUPE

229. Readings in Economics—Specialized topics in economics can be pursued by the student on an independent basis. Prerequisite: permission. *Cr* 3.

STAFF

230. Econometrics — An introduction to economic concepts and relationships expressed in quantitative terms. Major emphasis will be given to economic models related to demand, supply, production and cost functions; input-output analysis and other models will also be considered. Prerequisite: Ms 6 or 12, Ms 19, Ec 173, or permission of instructor. *Cr* 3.

368. 369. Manpower Research Seminar—An examination of the economic, social, and psychological factors affecting manpower development and utilization. This interdisciplinary seminar is part of the University's manpower research project. It gives students a unique opportunity to participate in current research, from problem formulation to data collection and analysis. By permission.

399. Graduate Thesis—*Cr* 6.

ENGLISH (Eh)

PROFESSORS HUNTING, HANKINS, HOLMES, MANLOVE, RANDEL, REYNOLDS, TERRELL, WENCE; ASSOCIATE PROFESSORS BENNETT, SPRAGUE; ASSISTANT PROFESSORS ANDERSEN, BAUSCHATZ, BROGUNIER, CARLSON, HATLEN, JAMES, LEMELIN, WILSON; INSTRUCTORS ADAMS, BAILEY, BENTON, BISHOP, CHAPMAN, FITZGERALD, HOBBS, KENDA, RENAUD, SEAMAN, WICKS; GRADUATE ASSISTANTS ARMESON, BUNKER, DUDLEY, ERICKSON, GRIMM, GRUDIS, HOLLENBERG, HARE, HILL, KURLAND, NOBERT, OBER, OLMSTED, SMITH, WAGNER, WILLIAMS, WOLFE, YACHYMIAK

There are six requirements for a major in English:

(1) Eh 21. 22. 23. 24. These courses should if possible be taken in the order listed, and the student should begin the sequence in the first semester of his sophomore year.

(2). Eh 7 or Eh 8. One of these courses should be taken in the sophomore year, if possible.

(3) Eh 43 and Eh 44.

(4) Eh 157 or Eh 158.

(5) Eh 153 or Eh 164.

(6) A minimum of 36 hours credit in the Department of English.

Among electives, English majors are strongly urged to choose as many as possible of the following courses: History of England (Hy 155. 156); History of Philosophy (Pl 101. 102. 103. 104); Modern Grammars (Eh 121) or the History of the English Language (Eh 167).

The department offers the Master of Arts degree in English, normally requiring 24 hours of course credits (12 of which must be numbered above 200; no more than nine of which may be in the Continuing Education Division) and the writing of a satisfactory thesis.

The department cooperates with the College of Education in its M.A.T. (Master of Arts in Teaching) program.

Courses in Writing

1. Freshman Composition—Intensive practice in expository writing, with reading of illustrative material. Required normally of freshmen. *Cr* 3.

MRS. CARLSON, Chairman

7. 8. Advanced Composition—A course for those who wish to develop greater skill in writing, either for their own pleasure or for professional use. *Not* a remedial course. First semester, the writing of formal and informal expository essays; second semester, descriptive and narrative writing. *Cr* 3.

MR. HOLMES, Chairman

17. Advanced Professional Exposition—Supervised practice in clear expository writing of formal reports, professional correspondence, and related materials. Open to students in any college, but not open to English majors in the College of Arts and Sciences. *Cr* 3. MR. HOLMES, Chairman

77. 78. Workshops in Fiction, Drama, or Poetry—An advanced course for students of demonstrated ability. Prerequisite: Eh 7 or 8 or permission of instructor. *Cr* 3. MR. HOLMES, MR. KENDA

101. 102. Directed Writing—Writing in such forms as the novel, drama, short story, poetry, essay, or literary criticism. Individual projects for students with demonstrated ability in writing. Students must have consent of instructor before they register for this course. *Cr* 1, 2, or 3, dependent on amount of writing, agreed upon in advance with the instructor. MR. HOLMES

285. The Theory of Composition—*Cr* 3. MRS. CARLSON

Undergraduate Courses in Literature

9. 10. Modern Literature—Readings in significant literature of the last half-century. Primarily for freshmen. Others by permission only. *Cr* 3.

MR. SPRAGUE, Chairman

15. 16. (See Cp 11. 12, which has replaced Eh 15. 16.)

21. 22. 23. 24. English Literature Survey—*Cr* 3. MR. WENCE, Chairman

21. English Literature from Beowulf to Spenser—*Cr* 3.

22. English Literature from Spenser to Johnson—*Cr* 3.

23. English Literature from Johnson to the Victorians—*Cr* 3.

24. English Literature from the PreRaphaelites to the Present—*Cr* 3.

25. Twentieth Century British Prose and Poetry—*Cr* 3.

MR. TERRELL, Chairman

43. 44. Survey of American Literature—Semester I: American Literature from Colonial times to the American Renaissance. Semester II: American Literature from the Rise of Realism to the present. *Cr* 3. MR. LEMELIN, Chairman

45. Twentieth Century American Prose and Poetry—*Cr* 3.

MR. TERRELL, Chairman

46. Writers of Maine—The Maine scene and Maine people as presented by Sarah Orne Jewett, E. A. Robinson, Edna St. Vincent Millay, Mary Ellen Chase, R. P. T. Coffin, Kenneth Roberts, E. B. White, and others. *Cr* 2.

(Students who are not majors in English will be particularly interested in Eh 1, 17, 9, 10, Cp 11, Cp 12, and Eh 46.)

Advanced Undergraduate Courses in Literature

(Graduate students are reminded that courses numbered 100 to 199 may be used for graduate credit only if prior approval has been given by the graduate student's advisory committee.)

155. Spenser—A study of the major works of Edmund Spenser. Special attention given to *The Fairie Queene*. *Cr* 3. MR. HANKINS

157. 158. Shakespeare—A survey of the comedies, history plays and tragedies. Comedies and histories in the first semester; tragedies in the second semester. *Cr* 3. MR. HANKINS

159. Elizabethan and Seventeenth-Century Lyric Poetry—Readings from Wyatt through Marvel, with special emphasis on Johnson and Donne. *Cr* 3.

160. Seventeenth Century English Prose—Readings from Hooker through Bunyan, with special emphasis on the prose of Donne, Bacon, and Browne. *Cr* 3.

161. 162. British Drama — Fall Semester: Shakespeare's contemporaries, with some attention to the drama before and after Shakespeare. Spring semester: a survey from the Restoration (1660) to 1900. *Cr* 3. MR. SPRAGUE

164. Milton—The poetry and prose, with attention to the literary and historical background. *Cr* 3.

165. Dryden and the Literature of the Restoration Period—Major works in Restoration literature. *Cr* 3. MR. MANLOVE

166. Swift, Pope, and the Literature of the Early 18th Century—*Cr* 3. MR. HUNTING

168. Johnson and His Circle—A study of the major works of Samuel Johnson and his contemporaries: Boswell, Goldsmith, Gibbon, Reynolds, Burke, Garrick, Mrs. Thrale, and Fanny Burney. Some attention given to the beginnings of Romanticism. *Cr* 3. MR. MANLOVE

169. 170. Poetry of the Romantic Movement—The first semester: Wordsworth, Coleridge, and their contemporaries, against the background of their times. The second semester: Byron, Shelley, Keats, and their contemporaries. *Cr* 3. MR. HANKINS

171. Victorian Poetry—Browning, Tennyson, Arnold, the PreRaphaelites, and their contemporaries. *Cr* 3. MR. WILSON

172. The American Renaissance—The great authors of New England in the mid-19th century—their works, personalities and social background. *Cr* 3. MR. LEMELIN

174. 175. The American Novel — Semester I: the novel from Brown to James; semester II, from Crane to the present. *Cr* 3. MR. RANDEL

179. The American Short Story—Selected short stories from Hawthorne and Poe to the present. *Cr* 3. MRS. CARLSON

181. The Earlier English Novel — The principal novelists from the beginnings to Sir Walter Scott. *Cr* 3. MR. HUNTING, MR. WENCE

182. The Later English Novel—The principal novelists from Dickens to Hardy. *Cr* 3. MR. HUNTING, MR. WENCE

183. English Prose Stylists of the Nineteenth Century—Not including fiction. The major essayists from Lamb to Stevenson. Studies of content and literary style. *Cr* 3. MR. JAMES

190. Topics in English or American Literature — Not offered 1969-70. *Cr* 3. STAFF

199. Distinguished Lecturer Seminar—This course, like Eh 190, is intended to supplement, and allow occasional experiments within, the existing curriculum. Not offered 1969-70. *Cr* 3.

Graduate Courses in Literature

254. Pre-Shakespearean Drama—Medieval and Renaissance drama in England to 1590. The evolution of secular drama from its religious origins through the achievement of Marlowe. *Cr* 3. MR. HANKINS

255. Sixteenth Century Prose and Verse—The prose and the non-dramatic poetry of the 16th century. Major authors of the Tudor Age (1485-1603) in their cultural setting, from Skelton to Donne. *Cr* 3 MR. SPRAGUE

256. Special Studies in Shakespearean Tragedy — Intensive studies of Shakespearean tragedy with detailed analysis of a few plays. Some attention to textual problems. Manuscript transmission, interpretations of doubtful passages, etc. Readings, discussion, and critical papers. Prerequisite: Eh 157. 158 or its equivalent. *Cr* 3. MR. HANKINS

257. Special Studies in Shakespearean History Plays—Intensive study of the history plays, with special emphasis on the War of the Roses cycle. Some at-

tention to textual problems and historical background. Readings, discussions, and critical papers. Prerequisite: Eh 157. 158 or its equivalent. *Cr* 3.

MR. HANKINS

258. Special Studies in Shakespearean Comedy—Intensive study of four Shakespearean Comedies—e.g., *Love's Labours Lost, The Merchant of Venice, As You Like It, The Tempest,* with analysis of comic situations, comic language, didactic elements, and sources. Frequent critical papers. Prerequisite: Eh 157. 158 or its equivalent. *Cr* 3. MR. HANKINS

259. Shakespeare's Contemporaries and Followers—Chapman, Marlowe, Johnson, Middleton; Webster and Ford; Beaumont and Fletcher. *Cr* 3.

MR. SPRAGUE

260. Restoration Drama—Types of drama on the Restoration stage, 1660-1700, and the nature of the theater, acting, and society of the age. *Cr* 3.

MR. SPRAGUE

270. The American Drama—The development of drama in America from colonial times to the First World War. *Cr* 3. MR. LEMELIN

271. Early American Literature—The development of American literature from the beginnings to 1800. Offered on request. *Cr* 3. MR. LEMELIN

273. The Rise of Realism in America—Studies in realistic and naturalistic literature from 1865 to 1914. *Cr* 3. MR. RANDEL

274. 275. Modern British and American Literature—Semester I: Modern British and American Prose; semester II, Modern British and American Poetry. *Cr* 3.

292. Literature of Maine and the Atlantic Provinces—Studies in the major writers of Maine and the eastern provinces of Canada. *Cr* 3.

325. Bibliography and Methods of Research—A study of bibliographical materials and methods of research, to meet the practical needs of the graduate student of English and American literature. Required of all graduate students in English. *Cr* 1. MR. SPRAGUE

343. Seminar in American Romanticism—*Cr* 3. MR. RANDEL

344. Seminar in American Realism—*Cr* 3. MR. RANDEL

350. Independent Reading—Extensive readings on an individual basis under the direction of a member of the Graduate Faculty, who will determine in advance the amount of credit to be granted. Normally, no more than three credit hours may be used for the M.A. degree. Prerequisite: 9 hours of graduate work. *Cr* 1, 2, or 3. STAFF

391. Sixteenth Century Topics—*Cr* 3. MR. HANKINS, MR. SPRAGUE

392. Seventeenth Century Topics—*Cr* 3. MR. SPRAGUE

393. Eighteenth Century Topics—*Cr* 3. MR. HUNTING, MR. MANLOVE

394. Nineteenth Century Topics—*Cr* 3. MR. HANKINS, MR. LEMELIN

395. Twentieth Century Topics—*Cr* 3. MR. ANDERSEN, MR. TERRELL

399. Graduate Thesis—*Cr Ar.* THE STAFF

Courses in Linguistics and in Old and Middle English Literature

121. Modern Grammars — Traditional, structural, and generative grammars, with particular implications for prospective teachers of English and others interested in the basic theories of grammar. Attention is given to problems of usage. *Cr* 3. MR. BAUSCHATZ, MR. BENNETT

153. Chaucer—Selections from *The Canterbury Tales* and the minor poems,

stressing the reading of Chaucer's poetry, literary range and qualities, and picture of his times. *Cr* 3. MR. BENNETT

167. History of the English Language—Main aspects of the development of Modern English from Old and Middle English; words and their backgrounds; changes in sound, form, and meaning. *Cr* 3. MR. BAUSCHATZ, MR. BENNETT

241. General Linguistics — Linguistics as a basis for understanding the theory and functioning of language; modern methods of phonological, morphological, and syntactic analysis, with some attention to application in such fields as historical reconstruction and dialectology. *Cr* 3. MR. BAUSCHATZ, MR. BENNETT

243. Old English—Essentials of Old English grammar; poetry and prose selections. *Cr* 3. MR. BENNETT

244. Beowulf—A reading of the poem in Old English; discussions of the literary problems which it presents. *Cr* 3. MR. BENNETT

245. Studies in Middle English: I—The English language and its development as revealed by selected texts from the Norman Conquest to Chaucer. *Cr* 3. MR. BAUSCHATZ, MR. BENNETT

246. Studies in Middle English: II—A study of the works of the leading writers, exclusive of Chaucer, in the Middle English period. Prerequisite: Eh 245 or its equivalent. *Cr* 3. MR. BAUSCHATZ, MR. BENNETT

250. Special Problems in Linguistics—Studies in trends and developments in linguistic science, with primary emphasis on American linguistics since 1925. Prerequisite: Eh 241 or its equivalent. *Cr* 3. MR. BENNETT

390. Seminar in the Literature of Medieval England—*Cr* 3. MR. BENNETT

396. Seminar in Linguistics and Semantics—*Cr* 3. MR. BENNETT

Courses in the Teaching of English

184. Teaching of English in the Secondary School—A discussion of principles and practices in the teaching of literature, language, and composition, with exercises in theme correction. *Cr* 3. MRS. CHAPMAN, MR. HOLMES

185. Workshop for Secondary School Teachers of English—Lectures by staff and eminent specialists in reading, composition, language, and literature. Designed for experienced secondary school English teachers who want to enrich their backgrounds in their subject matter. Enrollment limited to 25 students. Course given in Summer Session only. *Cr* 3. MRS. CHAPMAN, MR. HOLMES

285. The Theory of Composition—*Cr* 3. MRS. CARLSON

384. Teaching English in College—Designed to aid graduate assistants and certain others in learning and using effective methods of teaching freshman composition and literature. Required of all graduate assistants in English. *Cr* 1. MRS. CARLSON

FOREIGN LANGUAGES AND CLASSICS

PROFESSORS MOODY, MILES, GROSS†, RUSSELL, AND O'NEILL; ASSOCIATE PROFESSORS CLARK, GUTMAN, LUSZCZYNSKI, REID, RIOUX, ROGGENBAUER, ROUBEY, AND TATEM; ASSISTANT PROFESSORS BRIMMER, FITZPATRICK*, GALBIS, HALL, HAYES, HERLAN, LÓPEZ MUÑOZ, PYLES, VITZTHUM, AND WALLACE; LECTURER MRS. GROSS†; INSTRUCTORS MRS. DELPHENDAHL, MR. DOCKERY, MR. FERRANDO, MISS FRENCH, MR. KAHN, MRS. LUSZCZYNSKI, MRS. SINGERMAN, MR. SINGERMAN, AND MR. ZOLLITSCH.

The department offers major work to candidates for the bachelor of arts degree in the following subject fields: French, German, Spanish, Romance languages, modern languages, Latin, comparative literature and international affairs in accordance with the requirements listed below.

French, German and Spanish—Students electing to major in French, German, or Spanish will be required to take a minimum of 30 hours in courses of the subject matter field beyond the intermediate level, of which at least 18 hours must be in literature courses in the 100 series, including 6 hours of the appropriate survey course (Fr 109. 110, Gm 109. 110, Sp 109. 110). They will also be required to take Fr 7/8, Gm 7/8, or Sp 7/8. These should be taken in the junior year or earlier, if possible.

Romance Languages—Students electing to major in Romance Languages will be required to take a minimum of 30 hours chosen from literature and related courses in French and Spanish beyond the intermediate level, of which at least 24 hours must be in 100 series literature courses of which 12 must represent survey courses (Fr 109. 110, Sp 109. 110) in the two languages. They will also be required to take either Fr 7/8 or Sp 7/8.

Modern Languages—Students electing to major in Modern Languages will be required to take a minimum of 30 hours chosen from literature and related courses in German and Russian, or in one of the Romance Languages and German, or Russian, beyond the intermediate level, of which at least 24 hours must be in 100 series literature courses, of which 12 must represent survey courses in the languages chosen (Fr 109. 110; Sp 109. 110; Gm 109. 110; Ru 9. 10). They will also be required to take either Fr 7/8, Gm 7/8, Sp 7/8, or Ru 7/8.

Latin—Students electing to major in Latin will be required to take a minimum of 22 hours of the subject matter field beyond the intermediate level. Lt. 47. 48 is also required and should be taken in the junior year or earlier.

Comparative Literature—The department participates in an interdepartmental major in Comparative Literature. Interested students should see page 84 of this catalog.

International Affairs—Students electing to major in International Affairs should see page 114 of this catalog.

Junior Year Abroad—It is possible for students majoring in a foreign language to spend a semester or an academic year in a foreign university as part of their major program. Students may consult the chairman of the department regarding this possibility.

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* On leave of absence 1969-1970.

† On leave of absence, Spring Semester, 1969-1970.

Hy 5/6 is required for students whose main concentration is French or German; Hy 5/6, or Hy 147. 148, is required for Spanish majors; and Hy 101. 102, for Latin majors.

Fl 166 is normally required for certification for teaching in elementary or secondary schools.

Courses recommended for students who do not major in the department, but who plan to obtain certification for teaching French, are: Fr 7/8, Fr 57. 58, Fr 109. 110, Fl 166, and a minimum of two semesters of advanced literature courses. For those who wish to obtain certification for teaching German, the following courses are recommended: Gm 7/8, Gm 57. 58, Gm 109. 110, Fl 166, and a minimum of two semesters of advanced literature courses. For those who wish to obtain certification for teaching Spanish, the following courses are recommended: Sp 7/8, Sp 57. 58, Sp 109. 110, Fl 166, and a minimum of two semesters of advanced literature courses. To obtain certification for teaching Latin, Lt 9. 10, Lt 47. 48, Fl 166, and minimum of two semesters of literature courses are recommended.

The department also offers work leading to the master of arts degree in French, Spanish, and German. A program of courses up to 24 hours which does not duplicate undergraduate work will normally be selected from courses numbered 100 or above in the French, German, and Spanish curricula listed below. Evidence of oral ability in the language undertaken will be required. The thesis is an essential aspect of the work and normally carries 6 hours credit. The Summer Session Catalog should be consulted for special aspects involved when the degree is sought through attendance at summer sessions. See also the Graduate School Catalog.

FOREIGN LANGUAGES (Fl)

166. The Teaching of Foreign Languages — Principles and practices of teaching foreign languages. Analysis of current trends and methods. Application of language-learning principles to classroom procedures. Theory and practice of language methodologies at different learning levels. For seniors seeking certification in foreign language teaching. *Cr* 3. MR. O'NEILL, MR. HALL

201. Introduction to General Linguistics—Grammatical structure; phonology; morphology, and syntax. The course will include discussion of language families; linguistic history; language and culture. *Cr* 3. MR. GUTMAN

†***221. 222. Seminar in Literary Research Methods***—Literary topics transcending national boundaries will be chosen to provide training in the methods and techniques of literary research for students of French, German, and Spanish literature. *Cr* 3. STAFF

FRENCH (Fr)

1-2. Elementary French—Development of listening comprehension, speaking, reading, and writing skills. Laboratory practice. For students who have had no French or less than two years of high school French. *Cr* 3. STAFF

3/4. Intermediate French—For students who have completed Fr 1-2 or two or more years of high school French. Laboratory practice. Review of grammatical structures. Students will be assigned to this course, or to Fr 5/6, on the basis of their achievement in previous French courses or of their scores on a

language proficiency test. Completion of this course fulfills the language generalization requirement. *Cr* 3. STAFF

5/6. Advanced Intermediate French—Should be elected in place of Fr 3/4 by students who have achieved a high level of performance in Fr 1-2 or in equivalent high school French courses. Laboratory practice, grammatical review, free composition, readings. Completion of this course fulfills the language generalization requirement. *Cr* 3. STAFF

7/8. Practical French—Systematic training in correct pronunciation and usage, and in vocabulary building, with written and oral practice, phonetics and work in the laboratory. Prerequisite: Fr 4, Fr 6, or the equivalent. This course, which is required for majors, should be taken in the junior year or earlier, if possible. *Cr* 3. STAFF

9. 10. Supplementary Oral French—This course, which is designed for students who desire additional oral training and practice in conjunction with Fr 3/4 or Fr 5/6, may also be elected in combination with other courses and may with permission be repeated for credit in successive years. *Cr* 1. STAFF

11. 12. Readings in French Literature—For students who wish further practice in reading before beginning advanced literature courses. Discussion and analysis in French. Prerequisite: Fr 4, Fr 6, or equivalent. *Cr* 3. STAFF

20. French Phonetics for Undergraduates — A formal study of the French sound system and an initiation to phonetic transcription, with practical and remedial work in pronunciation. Prerequisite: Fr 4, Fr 6, or equivalent. *Cr* 3. MR. GUTMAN

57. 58. French Civilization — Readings, discussions, lectures, oral and written reports on varied aspects of France, its people, institutions, and culture to provide the background essential to an understanding of French literature, thought, and artistic expression. Open to students, including freshmen and sophomores, who have completed Fr 4, Fr 6, or the equivalent. *Cr* 3. STAFF

109. 110. Introduction to French Literature—A survey of the important periods of French literature from the Middle Ages to the French Revolution. Prerequisite: Fr 4, Fr 6, or the equivalent. This course, which is required for majors in French, should be taken in the junior year or earlier, if possible. *Cr* 3. STAFF

153. The French Novel Between the World Wars—Readings from Gide, Proust, Camus, and others. Prerequisite: Fr 110, or permission. *Cr* 3. MR. CLARK

154. The French Novel from World War II to the Present—Contemporary trends in the novel; with some attention also to the short story. The post-war works of Camus, Sartre; the anti-novel, as well as the works of Claude Simon, Hervé Bazin, Pierre Gascar, and others. Prerequisite: Fr 110, or permission. *Cr* 3. MR. CLARK

156. The Twentieth Century French Theatre — Representative plays of Claudel, Giraudoux, Anouilh, Montherlant, and, including the "Theatre of the Absurd" of Genêt, Beckett, and Ionesco. Prerequisite: Fr 110, or permission. *Cr* 3. MR. CLARK

167. Advanced French Grammar—Designed to provide an adequate foundation in French grammar and syntax for prospective teachers. *Cr* 3. MR. RIOUX

†***168. Advanced Composition and Stylistics***—Designed to develop an adequate proficiency in written French. Prerequisite: Fr 167, or permission. *Cr* 3. MR. RIOUX

171. 172. French Literature of the Seventeenth Century—Literary trends

in French classicism: Descartes, Pascal, Corneille, Racine, Molière, La Fontaine. Prerequisite: Fr 110, or permission. *Cr* 3. MRS. RUSSELL

173. 174. French Literature of the Eighteenth Century — Lectures and readings of the works of leading writers, including Voltaire, Montesquieu, Diderot, and Rousseau. Prerequisite: Fr 110, or permission. *Cr* 3. MR. ROUBEY

175. French Romantic Prose and Poetry—Lectures, readings, and discussions of representative writers of the Romantic movement, from its 18th century origins to the middle of the 19th century. Prerequisite: Fr 110, or permission. *Cr* 3. MR. O'NEILL

176. French Drama of the Nineteenth Century—Lectures, readings, and discussions of representative dramatists of the last century. (Fall semester). Prerequisite: Fr 110, or permission. *Cr* 3. MR. CLARK

177. 178. The Nineteenth Century French Novel—Representative novels of Balzac, Stendhal, Barbey d'Aurevilly, Flaubert, Maupassant, Zola, Villiers de l'Isle-Adam, Alain-Fournier and others, with some attention also to the short story. Prerequisite: Fr 110, or permission. *Cr* 3. MR. MOODY

179. The Age of Enlightenment—Readings in English translation of the political, social, and philosophical writings of Montesquieu, Voltaire, Diderot, Rousseau, and other French writers of the 18th century. May be elected by juniors, seniors, and sophomores with permission. (This course may not be used to meet the requirements of a major or the M.A. degree in French.) *Cr* 3. MR. ROUBEY

181. French Literature of the Medieval Period—Idealistic and popular developments, *La chanson de Roland*, theater, the chroniclers, Villon. Prerequisite: Fr 110, or permission. *Cr* 3. MR. RIOUX

182. French Literature of the Sixteenth Century—Humanism in the Renaissance, Rabelais, Ronsard, Montaigne. Prerequisite: Fr 110, or permission. *Cr* 3. MR. RIOUX

†***207. 208. Old French Language and Literature***—The evolution of the Old French language studied through texts representative of medieval literature. *Cr* 3.

‡***210. French Linguistics for Graduate Students***—General linguistic principles, concepts and procedures will be used to analyze in depth selected areas of French grammar. Phonology and morphology will receive reasonably thorough treatment with a bias towards the transformational-generative approach. *Cr* 3. MR. GUTMAN

291. 292. Individual Authors—A thorough study each semester of a representative author chosen for that semester. May be repeated for credit in successive years. *Cr* 3.

297. 298. Projects in French—Individual work on a project of the student's selection. Prerequisite: Permission of the department head. May be repeated for credit in successive years. *Cr Ar.*

‡***301. French Phonetics for Graduate Students***—A close examination of the theoretical aspects of the French sound system. The course will enable students to transcribe more difficult material and to work towards perfecting their pronunciation. *Cr* 3. MR. GUTMAN

†***310. Seminar in French Renaissance***—An analytical study of the major works of the Renaissance period. May be repeated for credit in successive years. *Cr* 3.

‡***320. Seminar in French Classicism***—Aspects, groups, and genres in the

literature of the 17th century with some attention to 18th century examples also, to be varied in successive years. May be repeated for credit. *Cr* 3. MRS. RUSSELL

†***330. Seminar in Literature of the Eighteenth Century***—Individual writers, movements, schools, and groups. Those studied will vary in successive years. May be elected for credit in successive years. *Cr* 3.

‡***340. Seminar in the Novel***—Trends and periods in the development of the novel and narrative form in France. The content will vary from year to year. May be elected in successive years. *Cr* 3. MR. LUSZCZYNSKI

†***350. Seminar in Romanticism*** — Trends and genres in the pre-romantic period and the literature of the 19th century. Content will vary from year to year. May be elected in successive years. *Cr* 3. MR. O'NEILL

‡***360. Seminar in Poetry***—Movements in French poetry. The genres, groups, and trends studied will vary from year to year. May be elected in successive years. *Cr* 3. MR. LUSZCZYNSKI

‡***370. Seminar in the Theatre***—Movements and periods in the French theatre. The period or movement studied will vary from year to year. May be elected in successive years. *Cr* 3. MR. CLARK

399. Graduate Thesis—*Cr* 6.

GERMAN (Gm)

1-2. Elementary German—Emphasis on development of listening comprehension, speaking, reading, and writing skills. Laboratory practice. For students who have had no German or less than two years of high school German. *Cr* 3. STAFF

3/4. Intermediate German—Continuation of 1-2. Laboratory practice. For students who have completed German 1-2 or have completed two or three years of high school German. Completion of this course fulfills the language generalization requirement. *Cr* 3. STAFF

5/6. Advanced Intermediate German—Should be elected in place of Gm 3/4 by students who have achieved a high level of performance in Gm 1-2 or in equivalent high school courses. Laboratory practice. Completion of this course fulfills the language generalization requirement. *Cr* 3. STAFF

7/8. Practical German—Systematic training in correct pronunciation and usage, and in vocabulary building, with written and oral practice, and work in the laboratory. Prerequisite: Gm 4, Gm 6, or the equivalent. This course, which is required for majors in German, should be taken in the junior year or earlier, if possible. *Cr* 3. MR. ROGGENBAUER

9. 10. Supplementary Oral German—This course, which is designed for students who desire additional oral training and practice in conjunction with Gm 3/4 or Gm 5/6, may also be elected in combination with other German courses and may with permission be repeated for credit in successive years. *Cr* 1. STAFF

13. Intermediate Scientific German—For students who have completed Gm 1-2 or have completed two or three years of high school German. Intended for students who wish to become acquainted with the techniques of translating scientific German. *Cr* 3. MR. ROGGENBAUER

14. Readings in Scientific German—Specialized reading for comprehension; individual projects and reports. Recommended as preparation for meeting graduate school language requirements. *Cr* 3. MR. ROGGENBAUER

16. German Play Production—Participation in reading, selection, acting and production of plays in the German language. Prerequisite: permission of the instructor. *Cr* 3. MR. HALL

†***57. 58. German Civilization***—Readings, discussions, lectures, and oral and written reports on Germany, its people, institutions, and culture for the purpose of providing the background essential to an understanding of German literature, thought, and artistic expression. Open to students, including freshmen and sophomores, who have completed Gm 4, Gm 6, or the equivalent. *Cr* 3. STAFF

109. 110. Introduction to German Literature—A survey of the important periods in German literature with readings of representative works. Prerequisite: Gm 4 or the equivalent. This course, which is required of students majoring in German, should be taken in the junior year or earlier if possible. *Cr* 3. MR. HAYES

‡***151. Enlightenment and "Storm and Stress"***—A survey of representative works with lectures in German. *Cr* 3. MR. ROGGENBAUER

‡***152. The Romantic School***—A survey of representative authors; as well as selected works by Kleist. *Cr* 3. MR. ROGGENBAUER

‡***155. Goethe***—Readings and discussion of works by Goethe, with primary emphasis on Faust. *Cr* 3. MR. MILES

‡***156. Schiller***—Readings and discussion of works by Schiller, including *Wilhelm Tell* and *Maria Stuart*. *Cr* 3. MR. MILES

†***157. 158. German Literature from 1832 to the Turn of the Century***—Important literary figures and movements with particular attention to the drama and novelle. *Cr* 3. MR. MILES

†***159. 160. German Literature of the Twentieth Century***—Prose, poetry, and drama by representative writers. *Cr* 3.

†***167. Advanced German Grammar and Composition***—Designed to provide an adequate foundation in German grammar, syntax, and composition for prospective teachers. *Cr* 3.

‡***207. Middle High German***—A systematic study of Middle High German grammar, accompanied by appropriate readings. *Cr* 3. MR. ZOLLITSCH

‡***208. Medieval German Literature***—From the earliest documents to late medieval literature, with special emphasis on the classical period, 1150-1250. *Cr* 3. MR. ZOLLITSCH

†***212. The Age of Baroque***—German literature of the 17th century, focusing on Opitz, Gryphius, and Grimmelshausen. *Cr* 3.

†***290. Seminar in Literary Genres***—Historical analysis of (a) German Lyric Poetry, or (b) the German Novelle, or (c) the German Bildungsroman, showing the development of form and idea. *Cr* 3. STAFF

291. 292. Individual Authors—A thorough study each semester of a representative author chosen for that semester. This course may be elected by seniors with approval of the chairman and may be repeated by graduate students in successive years. *Cr* 3. STAFF

297. 298. Projects in German—Individual work on a project of the student's selection. Prerequisite: permission of the department head. May be repeated for credit in successive years. *Cr Ar*.

399. Graduate Thesis—*Cr* 6.

GREEK (Gk)

‡*1-2. Elementary Greek*—Fundamentals of the Greek language. In the second semester, selections from Euripides' *Alcestis*. For students who have had little or no preparation in Greek. *Cr* 4. MR. TATEM

†*3/4. Intermediate Greek*—In the first semester, Plato's *Apology, Crito* and selections from the *Phaedo*. In the second semester, selected books from Homer's *Iliad*. *Cr* 3. MR. TATEM

ITALIAN (It)

‡*1-2. Elementary Italian*—Development of listening comprehension, speaking, reading, and writing skills. Laboratory practice. For students who have had no Italian or less than two years of high school Italian. *Cr* 3. MR. ROUBEY

†*3/4. Intermediate Italian*—For students who have completed Italian 1-2 or two or more years of high school Italian. Laboratory practice. Review of grammatical structures. Completion of this course fulfills the language generalization requirement. *Cr* 3. MR. ROUBEY

LATIN (Lt)

1-2. Elementary Latin—Fundamentals of the Latin language. *Cr* 3. MRS. DELPHENDAHL

3/4. Intermediate Latin—Selected reading from masters of Latin prose and poetry. For students who have had Latin 1-2 or at least two years of high school Latin. Completion of this course fulfills the language generalization requirement. *Cr* 3. MRS. DELPHENDAHL

9. 10. Readings in Latin Literature — Selections from Latin prose and poetry with emphasis upon literary values. *Cr* 3. MR. TATEM

47. 48. Latin Prose Composition and Stylistics — Review of grammar and syntax, with particular attention to Cicero and Tacitus. The writing of prose, especially in the style of Cicero. This course, which is required for majors, should be taken in the junior year or earlier, if possible. *Cr* 3. MR. TATEM

151. Roman Comedy: Plautus and Terence—One play of each dramatist will be read. The sources of Roman comedy, its literary features, and influence upon later literature. Given every three years; offered in 1969-70. *Cr* 3. MR. TATEM

152. Roman Philosophical Thought—Selections from Lucretius, *De Rerum Natura*, and Cicero's philosophical essays. The three major philosophical schools: Academic, Stoic, Epicurean, and their influence on Roman thought. Given every three years; offered in 1969-70. *Cr* 3. MR. TATEM

153. Poetry of the Republic and Early Empire—The lyric poetry of Catullus. The *Odes* of Horace. The origin and development of satire, with selections from the satires of Horace and Juvenal. Given every three years; next offered in 1971-72. *Cr* 3. MR. TATEM

154. Prose of the Republic and Early Empire—Selections from Cicero's letters, Pliny's letters, and Tacitus' *Annals*. Given every three years; next offered in 1971-72. *Cr* 3. MR. TATEM

181. Virgil: The Eclogues, Georgics, Aeneid — The poet's background, achievement, and influence upon later literature. Given every three years; next offered in 1970-71. *Cr* 3. MR. TATEM

182. Survey of Latin Literature—A rapid survey from the Archaic Age to Medieval Latin. Lectures, discussions, reports, and assigned readings. Given every three years; next offered in 1970-71. *Cr* 3. MR. TATEM

197. 198. Projects in Latin—Individual work on a project of the student's selection. Prerequisite: permission of the department head. *Cr Ar.* (maximum: 3 hrs.) STAFF

RUSSIAN (Ru)

1-2. Elementary Russian—Development of listening comprehension, speaking, reading, and writing skills. Laboratory practice. For students who have had no Russian or less than two years of high school Russian. *Cr* 3. MR. PYLES

3/4. Intermediate Russian—Continuation of 1-2. Laboratory practice. For students who have completed Russian 1-2, or have completed two or three years of high school Russian. Completion of this course fulfills the language generalization requirement. *Cr* 3. MR. PYLES

7/8. Practical Russian—Systematic training in correct pronunciation and usage, and in vocabulary building, with written and oral practice, and work in the laboratory. Prerequisite: Ru 4, or the equivalent. Well qualified students who have not taken Ru 7 may with permission elect Ru 8. *Cr* 3. MR. PYLES

9. 10. Introduction to Russian Literature—Russian 9 is a systematic presentation of selected works of the most important writers from Pushkin through Chekhov. Russian 10 is a systematic presentation of selected works of the most important writers from the Modernist Movement through the present. Prerequisite: Ru 4, or the equivalent. *Cr* 3. MR. PYLES

SPANISH (Sp)

1-2. Elementary Spanish—Development of listening comprehension, speaking, reading, and writing skills. Laboratory practice. For students who have had no Spanish or less than two years of high school Spanish. *Cr* 3. STAFF

3/4. Intermediate Spanish—Continuation of 1-2. Laboratory practice. For students who have completed Spanish 1-2 or who have completed two or three years of high school Spanish. Completion of this course fulfills the language generalization requirement. *Cr* 3. STAFF

5/6. Advanced Intermediate Spanish — Should be elected in place of Spanish 3/4 by students who have achieved a high level of performance in Spanish 1-2 or in equivalent high school Spanish courses. Laboratory practice. Completion of this course fulfills the language generalization requirement. *Cr* 3. STAFF

7/8. Practical Spanish—Systematic training in correct pronunciation and usage, and in vocabulary building, with written and oral practice, phonetics and work in the laboratory. Prerequisite: Sp 4, Sp 6, or equivalent. This course, which is required for majors, should be taken in the junior year or earlier, if possible. *Cr* 3. MR. FERRANDO

9. 10. Supplementary Oral Spanish—This course, designed for students who desire additional oral training and practice in conjunction with Sp 3/4, may also be taken in combination with other courses in Spanish and may with permission be repeated for credit in successive years. *Cr* 1. STAFF

†***57. 58. Hispanic Civilization*** — Readings, discussions, lectures, oral and written reports on varied aspects of Hispanic civilization to provide the back-

ground needed for an intelligent understanding of Hispanic literature, thought, and artistic expression. Open to students, including freshmen and sophomores, who have completed Sp 4, Sp 6, or the equivalent, *Cr* 3.

109. 110. Introduction to Spanish Literature—A survey of the important periods and trends in Spanish literature with reading of representative works. Prerequisite: Sp 4, or the equivalent. This course, which is required of students majoring in Spanish, should be taken in the junior year or earlier, if possible. *Cr* 3. MR. GALBIS

†***149. 150. Spanish Literature of the Eighteenth and Nineteenth Centuries***—Important examples of classicism, romanticism, regionalism, and realism will be studied. There will be special attention in the spring semester to such writers as Galdós and Benavente. *Cr* 3.

‡***151. 152. Spanish Literature of the Twentieth Century***—Fall semester: The Generation of 1898. Spring semester: Tremendismo from the Civil War to the present. *Cr* 3. MR. LÓPEZ MUÑOZ

†***153. 154. The Modern Latin-American Novel***—Fall semester: From the late nineteenth century to World War II. Spring semester: The contemporary period with attention to the literary renaissance in Mexico, Argentina, and Peru. *Cr* 3. MR. GROSS

‡***155. 156. Latin-American Literature from the Colonial Period to the Late Nineteenth Century***—A survey of the important trends, periods, and works. *Cr* 3. MRS. LUSZCZYNSKI

‡***159. Cervantes***—A study of the life and literary works of Cervantes, with special emphasis upon the reading interpretation of *Don Quijote*. Lectures on the political, social and literary background of the period. *Cr* 3. MR. GROSS

‡***160. The Renaissance and Golden Age***—Readings of representative masterpieces of the period when Spain emerged from the Middle Ages, reached cultural and political unity and built its colonial emprie. *Cr* 3. MR. GROSS

167. Advanced Spanish Grammar and Composition—Designed to provide an adequate foundation in Spanish grammar, syntax, and composition for prospective teachers. *Cr* 3. MR. GALBIS

291. 292. Individual Authors—A thorough study each semester of a representative author chosen for that semester. May with permission be elected by seniors and may be repeated by graduate students for credit in successive years. *Will be offered only upon sufficient demand. Cr* 3. STAFF

297. 298. Projects in Spanish—Individual work on a project of the student's selection. Prerequisite: permission of department head. May with permission be repeated for credit in successive years. *Cr Ar.* STAFF

399. Graduate Thesis—*Cr* 6.

CLASSICS (Cl)

1. 2. Greek and Latin Literature in English Translation — The first semester is devoted to Greek literature; the second semester to Latin literature. No knowledge of either language is necessary. This course satisfies the humanities requirement of the College of Arts and Sciences. *Cr* 3. MR. TATEM

GEOLOGICAL SCIENCES (Gy)

PROFESSORS OSBERG, BORNS; ASSOCIATE PROFESSORS DENTON, HALL, HOWD; ASSISTANT PROFESSORS FINK, MYER, NORTON

The geological sciences are concerned with the physical and chemical characteristics of minerals and rocks, with their occurrence, arrangement, and surface expression, and with the history of the earth and its organic inhabitants. The curriculum provides for a basic understanding of the geological sciences and is sufficiently flexible to allow students with interests in geochemistry, geophysics, paleontology, and oceanography to pursue additional courses in appropriate ancillary sciences.

A geology major is prepared to enter directly into industry or survey work, or to enter graduate school in geology. In addition, if Zo 3/4, Ch 151/152, and Ch 161/162 are taken the requirements for medical or dental school, or programs in medical technology are fulfilled.

The requirements for the major include: Gy 111; Gy 113; Gy 114; Gy 116; Gy 118; Gy 155; Gy 157; Gy 158; Ch 13-14; Ps 1a/2a; Ms 12; Ms 19; Ms 27; Ms 28 and Ms 169.

The specimen curriculum is somewhat flexible and may be altered for individuals with previous geological training. Special interdisciplinary programs may be arranged after consultation with the departmental undergraduate advisor.

GEOLOGY SPECIMEN CURRICULUM

Freshman Year

FALL SEMESTER			Hours	SPRING SEMESTER			Hours
Eh	1	English Composition or Eh 9, Modern Literature	3	Eh	1	Freshman Composition or Eh 10, Modern Literature	3
Ch	13	Chemical Principles	4	Ms	4	Algebra and Trigonometry	3
		Language	4	Ch	14	Chemical Principles	4
		Social Science	3			Language	4
Sh	1	Speech	3			Social Science	3
			17				15

Sophomore Year

			Hours				Hours
Ms	19	Prin. of Statistical Inference	3	Ms	12	Analytical Geom. & Calculus	4
Gy	111	Field Geology I	3	Gy	116	Social Science	3
		Language	3	Gy	114	Mineralogy	4
		Social Science	3	Ms	169	Computer Programming	3
		Humanities	3			Language	3
			15				17

Junior Year

			Hours				Hours
Ms	27	Analytical Geom. & Calculus	4	Ms	28	Analytical Geom. & Calculus	4
Ps	1a	General Physics	4	Ps	2a	General Physics	4
Gy	113	Field Geology II	3	Gy	118	Field Geology III	3
Gy	155	Optical Mineralogy	4	Gy	116	Invertebrate Paleontology	3
				*Gy	160	Seminar	2
			15				16

Senior Year

			Hours				Hours
Gy	157	Thermodynamic Basis of Mineral Associations	4	Gy	158	Petrology of Metamorphic & Igneous Rocks	5
		Humanities	3	*Gy	160	Seminar	2
		Electives	8			Electives	8
			15				15

* Offered in alternate years.

Courses for Undergraduate Students

1 (1a). Aspects of the Natural Environment—A study of earth materials and processes including: the structure of matter, the formation of igneous rocks, radioactive age-dating, chemical and mechanical destruction of rocks, formation of sedimentary rocks, evolution of mountain belts, and the formation of metamorphic rocks. Laboratory work includes a consideration of earth materials in preparation for two compulsory one-day weekend field trips. Gy 1: *Lec* 3, *Lab and field trips, Cr* 4; Gy 1A: *Lec* 3, *Cr* 3.

2 (2a). Aspects of the Natural Environment—An examination of the structure and composition of the interior of the earth, mountain building processes; the origin and use of paleomagnetic data in the continental drift question; the origin and evolution of the atmosphere, the hydrosphere, and life; mechanisms and patterns of biological evolution. The course ends with a survey of man's place in and utilization of his environment. Laboratory work includes preparation for one compulsory two-day field trip in May. Prerequisite: Gy 1-1a. Gy 2: *Lec* 3, *Lab and field trip, Cr* 4; Gy 2a: *Lec* 3, *Cr* 3.

6. Geology for Engineers—A study of geology as related to civil engineering practice. *Rec* 2, *Lab* 3, *Cr* 3.

21. 22. Geologic Problems—The study of and report upon some original investigation. Time to be arranged. Prerequisite: consent of instructor. *Cr* 1 and 2. May be taken more than once.

Courses Primarily for Undergraduate Students but Open to Graduate Students

111. Field Geology I—An introduction in the field to basic observations, concepts and techniques of stratigraphy and simple structural geology. Use of the Brunton compass and plane table and alidade. Three one-day field trips, three weekend field trips. Prerequisite: consent of instructor. *Rec* 2, *Lab* 4, *Cr* 3.

113. Field Geology II—Field methods of structural and stratigraphic analysis and synthesis of rocks having undergone multiple deformation. Use of the Schmidt net in mapping and solving structural problems. Four weekend and one afternoon field projects. Prerequisite: Gy 111 and consent of instructor. *Rec* 2, *Lab* 4, *Cr* 3.

114. Mineralogy—An introduction to crystallography and the crystal chemistry of minerals. Identification of the common minerals by their physical properties. Prerequisite: Ch 13/14 and consent of instructor. *Rec* 3, *Lab* 3, *Cr* 4.

116. Invertebrate Paleontology—Classification and evaluation of the major phyla of fossil invertebrates and their use in stratigraphic interpretation. Prerequisite: consent of instructor. *Lec* 2, *Lab* 2, *Cr* 3.

118. Field Geology III—Introduction to geologic mapping, including an introduction to photogeology and altimetry. Completion of a mapping project and preparation of a report. Prerequisite: Gy 113 and consent of instructor. *Rec* 1, *Lab* 5, *Cr* 3.

155. Optical Mineralogy—Elementary theory of the polarizing microscope and the optical properties of crystalline substances. Use of the polarizing microscope in the determination of non-opaque minerals. Prerequisite: Gy 114. *Lec* 3, *Lab* 4, *Cr* 4.

157. Thermodynamic Basis of Mineral Associations — Thermodynamic study of heterogeneous systems with particular attention to open systems. Relationships between chemical composition, mineralogical content, and external parameters in rocks. Prerequisite: Gy 114, Ms 28. *Lec* 3, *Rec* 1, *Cr* 4.

158. Petrology of Igneous and Metamorphic Rocks—Mode of occurrence and characteristics of igneous and metamorphic rocks with an intensive investigation of the important phase relationships attributable to them. Laboratory problems involve work with the polarizing microscope and instrumental chemical analysis. Three one-day field trips. Prerequisite: Gy 155, Gy 157 and Ms 19. *Lec* 3, *Lab* 4, *Cr* 5.

160. Seminar in Geology—Preparation and presentation of reports covering geological topics of interest. *Rec* 2, *Cr* 2.

Courses Primarily for Graduate Students but Open to Undergraduate Students

212. X-ray Analysis in Mineralogy—Introduction to the study of minerals by X-rays. The methods of the powder camera, diffractometer and precession camera are utilized on mineral powders and single crystals. Prerequisite: consent of instructor. *Lec* 3, *Lab* 3, *Cr* 4.

218. Low Temperature-Pressure Geochemistry—Ionic solution theory including solubility, complexing, osmotic processes, simple chemical reactions at the surface of the earth, and Eh-pH-pK relations. Topics covered will vary according to the group of students but may include: reactions in residual soil formation, chemical solution and precipitation of inorganic material in marine environments, supergene enrichment of ore deposits; ion-exchange processes in fresh and salt water environments; isotopic geochemistry relating to marine sedimentation and diagenetic processes. Prerequisite: consent of instructor. *Lec* 3, *Cr* 3.

221. Sedimentology—Origin and characteristics of the major sedimentary rock types and their use in environmental, paleogeographic, and tectonic interpretation. Laboratory use of thin sections and hand specimens. Prerequisite: consent of instructor. *Lec* 2, *Lab* 3, *Cr* 3.

242. Glacial and Pleistocene Geology—A study of the physical and the biological characteristics of the Pleistocene Epoch with special emphasis on glaciology, paleotemperature determinations and the stratigraphic techniques of pollen analysis, weathering of soils, and radiocarbon dating. One weekend and two one-day field trips. Prerequisite: consent of instructor. *Lec* 3, *Lab* 2, *Cr* 4.

257. Genesis of Ore Deposits—A study of chemical and physical factors controlling the formation of metallic mineral deposits. Experimental and theoretical information is considered and related to documented field observations. Laboratory includes microchemical techniques and preparation and study of polished sections. Prerequisite: consent of instructor. *Lec* 3, *Lab* 3, *Cr* 4.

258. Ore Deposits Exploration—Modern philosophy, guides, geochemical and geophysical techniques and computer applications leading to the discovery of ore deposits. Prerequisite: consent of instructor. *Lec* 3, Cr 3.

†***260. Marine Geology***—Current hypothesis dealing with the origin of the earth as a planet and the development of continents and ocean basins. Morphology and structure of the sea floor. Interpretation of geological and geophysical observations relevant to the origin and evolution of major tectonic features of ocean regions. Prerequisite: consent of instructor. *Lec* 3, *Cr* 3.

Courses for Graduate Students Only

301. Directed Study in Geology
399. Graduate Thesis

HISTORY (Hy)

PROFESSORS SEAGER, ALBION, JEFFREY, A. M. JOHNSON, MCCAFFREY, W. H. PEASE, STEWART, TRAFFORD; ASSOCIATE PROFESSORS DOTY, HAKOLA, REYNOLDS; ASSISTANT PROFESSORS BANKS, BATTICK, BEITZELL, BLANKE, CASEY, MCANDREW, NADELHAFT, J. H. PEASE, ROBERTSON, SMITH; LECTURER SCHRIVER; INSTRUCTOR MORGAN; GRADUATE ASSISTANTS CASS, CHURCHILL, GOLICZ, HOWE, IRELAND, L. JOHNSON, KAVANAGH, KELLY, MEEHAN, MUNDY, NOBLE, PHILIE, PLACHTA, ROUNDY, AND TAMMARO

The history major must complete Hy 3. 4, Hy 5. 6, and at least 24 hours of advanced history courses approved by his adviser.

So that the major will receive an adequate background in related disciplines, he must also take a minimum of 12 hours work in two of the following areas: (1) Political Science; (2) Economics; (3) Sociology, Psychology, or Anthropology; (4) Philosophy; (5) English, Foreign Literature, or Classics; (6) Art or Music. Introductory courses in these fields will count toward the satisfaction of the 12-hour minimum requirements.

Superior majors will take in addition at least one 200-level history course in each semester of their senior year. Other majors may be admitted to these 200-level courses by special permission.

The department offers the M.A. degree in history, with specialties in most areas of history. The Ph.D. degree is offered in United States history, Canadian-

† Offered in alternate years.

American Studies; and in the history of Great Britain and the Commonwealth. A special program in Military and Maritime History is also available. Further details may be found in the Graduate School Bulletin.

1. 2. Classical and Medieval Civilization—The social and cultural development of the ancient Greeks and Romans is treated in the first semester. The second semester deals with the social and cultural development of Western Europe in the Middle Ages. Particular attention is given to the great achievements in literature, philosophy, religion, and art. This course satisfies the humanities requirement of the College of Arts and Sciences. *Cr* 3. MR. ROBERTSON

3. 4. United States History—From 1789 to recent years. The development of democracy, growth of the West, slavery and sectionalism, the Civil War, Reconstruction, the making of modern America, industrialization, imperialism, and other topics. *Cr* 3. MR. HAKOLA, CHAIRMAN

5. 6. History of Western Europe—Europe and its civilization from the decline of the Roman empire to the present. The emphasis is upon the development of those political, economic, and social institutions which help to explain our present-day civilization. *Cr* 3. MR. TRAFFORD, CHAIRMAN

7. 8. Asian Civilization—A survey of the highlights of Asia's civilization from the ancient period to the present. The backgrounds of the present-day civilizations of India, China, Korea, and Japan will be considered. *Cr* 3. MR. CASEY

10. History of Maine—A survey of Maine's social, economic, and political life, from primitive times to the present. After a brief study of Indian life preceding white settlement, the periods of colonial, provincial, and state history are covered. *Cr* 3. MR. SCHRIVER

101. 102. Ancient History—The political, social, and economic history of the civilizations of the ancient Mediterranean world. Egypt, the Near East, and Greece will be studied in the first semester; Rome will be covered in the second semester. *Cr* 3. MR. ROBERTSON

103. 104. The Middle Ages—Europe from late antiquity through the Renaissance. Special emphasis will be placed on the Carolingian Empire, the origin, development and structure of feudalism, the medieval church and state, medieval theology and philosophy, and the coming of the Renaissance. Prerequisite: Hy 5 or permission. *Cr* 3. MR. ROBERTSON

107. The Renaissance and Reformation—The political, social, economic and cultural achievements of Europe in the period 1300-1650. The Protestant revolt, the Catholic reform, and the wars of religion will be evaluated. Prerequisite: Hy 5. 6 or permission. *Cr* 3. MR. BATTICK

108. Europe in the 17th Century—The major political and intellectual developments of the period will be emphasized. The special histories of each European state will be subordinated to the general problems of state-building, the growth of capitalism and political absolutism, and the diplomacy and wars of Europe as a whole. Prerequisite: Hy 5. 6 or permission. *Cr* 3. MR. BATTICK

109. Europe in the 18th Century—The history of the Continent from 1715 through the Congress of Vienna with emphasis on the Enlightenment, the Enlightened Despots and the origins of the French Revolution. The impact and spread of French revolutionary thought throughout Europe, and the influence of the personality and military campaigns of Napoleon on the Continent will be treated. Prerequisite: Hy 5. 6 or permission. *Cr* 3. MR. BEITZELL

110. Europe in the 19th Century—The history of the Continent from 1815 through the Franco-Prussian war. Liberalism and nationalism, reaction and revolution, socialism and imperialism will be considered. The impact of the unification of Germany and Italy on the politics and diplomacy of the Continent will also be covered. Prerequisite: Hy 5. 6 or permission. *Cr* 3.

MR. BEITZELL, MR. DOTY

111. 112. Europe Since 1870—The effect of industrialization, the emergence of the masses, the rise and fall of colonial empire and the impact of two world wars will be considered. Irrationalist philosophies on the creation of fascism and communism, the recasting of democracy, the development of the European state system and the economic integration of the continent will also be treated. Prerequisite: Hy 5. 6 or permission. *Cr* 3. MR. DOTY, MR. BLANKE

123. 124. History of Russia—Russian history from the earliest times to the present. The first semester of the course will treat the political, social, economic, and intellectual development of Tsarist Russia to the end of the Napoleonic Wars. Nineteenth century Russia, the decay of the Tsardom, the Bolshevik Revolution, and the subsequent internal development and expansion of the Soviet Union will occupy the attention of the second semester. Prerequisite: Hy 5. 6 or permission. *Cr* 3. MR. BLANKE

135. 136. History of China—The fall semester will be concerned with the history and culture of the Chinese people from earliest times to the 19th century. The spring semester will treat the Western penetration of China, the coming of the missionaries and the gunboats, the impact of Western ideas, and the resulting nationalist and revolutionary movements. Prerequisite: Hy 7. 8 or six hours of history, or permission. *Cr* 3. MR. CASEY

137. History of Modern Japan—The history of Japan during the past century with major focus on the Western penetration, the influence of Western ideas on traditional Japanese culture, the emergence of the modern Japanese industrial state, and the rise and defeat of the Japanese empire. Prerequisite: Hy 7. 8 or six hours of history, or permission. *Cr* 3. MR. CASEY

138. Problems of Southeast Asia — An analysis of European imperalist rivalries in the area together with a consideration of the special problems of the new nations recently emerged from colonialism. The background of the French and the American presence in Vietnam will also be treated. Prerequisite: Hy 7. 8 or six hours of history, or permission. *Cr* 3. MR. CASEY

139. 140. History of South Asia—A survey history of the Indian sub-continent since 1500 with emphasis on the rise of the Mughal dynasty, Anglo-French rivalries in India and the expansion of British influence. The second semester will treat the period of Crown Rule, the emergence of Indian nationalism, the role of Ghandi, and the problems of Muslin separatism. Prerequisite: Hy 7. 8 or six hours of history, or permission. *Cr* 3. MR. CASEY

147. 148. Hispanic America—The Spanish and Portuguese colonial empires in America from their establishment to their achievement of independence in the early 19th century. The second semester will mainly concern the national period of Hispanic America and an analysis of the contemporary problems and tensions of the area. Prerequisite: No freshmen. *Cr* 3. MR. JEFFREY

149. Argentina, Brazil, and Chile — A history of the major countries of South America from their independence in 1823 to the present with primary

emphasis on their social structures, political developments, and international relations. Prerequisite: Hy 148 or permission. *Cr* 3. MR. JEFFREY

150. Mexico—A history of Mexico from early times to the present. Emphasis will be placed on the social and political structure of Mexico, the Mexican wars of independence, and the revolutionary movements of the 20th century. Prerequisite: Hy 148 or permission. *Cr* 3. MR. JEFFREY

152. Problems of Latin America—An analysis and evaluation of contemporary Latin American problems. The internal tensions and international relations of the several countries will be considered, together with the rise, spread and development of Castroism in the area. Prerequisite: six hours of history or permission. *Cr* 3. MR. JEFFREY

155. 156. History of England—A general survey of the political, social, economic, and constitutional aspects of English history. Special attention will center on trial by jury, the evolution of Parliament, the Protestant revolt, the commercial and industrial revolutions, and the growth of political and economic democracy. Prerequisite: Hy 5. 6 or six hours of history. *Cr* 3.

MR. MCCAFFREY, MR. TRAFFORD

159. 160. History of Canada — Canada's history from the earliest settlements in New France to the present. Emphasis will center on the evolution of Canada within the British Empire-Commonwealth, relations with the United States, and on the background of contemporary constitutional, economic and cultural problems. Prerequisite: Hy 3. 4 or Hy 5. 6, or sophomore standing, or permission. *Cr* 3. MISS STEWART, MR. MCANDREW

161. American Colonial History to 1740—English colonial policy and the founding of the British colonies in America. The political, social and economic development of the American colonies in the 17th and early 18th centuries will be considered, as will the remote causes of the American Revolution. Prerequisite: Hy 3 or permission. *Cr* 3. MR. NADELHAFT

162. Revolution and Confederation, 1740-1789—A study of the origins of the American Revolution. The Revolutionary War will be evaluated with special attention to the attendant internal social and political revolution. Emphasis will also be given the problems of the Confederation period, the diplomacy of the new nation, and the background and events of the Constitutional Convention. Prerequisite: Hy 3 or permission. *Cr* 3. MR. NADELHAFT

165. Hamilton and Jefferson, 1789-1815—An analysis of the social and economic problems of the new nation with special attention to the Hamilton-Jefferson intellectual dichotomy, the foreign policy and constitutional development of the infant United States, and the emergence of political parties. The initial territorial and commercial expansion of the nation will also be considered. Prerequisite: Hy 3 or permission. MR. PEASE

166. The Age of Jackson, 1815-1850—A consideration of American political, cultural, social and economic development in the first half of the 19th century. Specific topics will include the controversies surrounding Jacksonian democracy, the Bank of the United States, internal improvements, the tariff, "Manifest Destiny," and the sectional-slavery issue. Prerequisite: Hy 3 or permission. *Cr* 3.

MR. PEASE

167. Civil War and Reconstruction, 1850-1877—The period of national disruption and reunification with emphasis on the collapse and reconstruction of America's political, constitutional and social fabric, the acceleration of economic

change, the emergence of the new industrialism, and the development of the new sectionalism. Prerequisite: Hy 4 or permission. *Cr* 3. MRS. PEASE

168. The Gilded Age in America, 1877-1914—The industrialization and transformation of the United States from a predominantly rural to a predominantly urban society. Emphasis will be given such topics as population movements, business and financial enterprise, labor organizations, religious and reform protests, imperialism, racism, populism, progressivism, and intellectual and social change. Prerequisite: Hy 4 or permission. *Cr* 3. MRS. PEASE

169. Early 20th Century America, 1914-1938—The Wilson era of reform and intervention in World War I, the return to isolation, the age of business in prosperity and depression, and the New Deal period of Franklin D. Roosevelt. Also stressed will be the changes in American politics, economics, organized labor, the judiciary, and the arts. Prerequisite: Hy 4 or permission. *Cr* 3.

MR. SMITH, MR. REYNOLDS

170. America Since 1938—The rise of contemporary American society will be examined through the coming of World War II, the Cold War and the nuclear age, the emergence of the affluent society and the concurrent civil rights and student movements. Special attention will be paid the problems of increased federal centralization, the reform governments of the 1960's, the appearance of the military-industrial-aerospace complex, and resulting social reactions. Prerequisite: Hy 4 or permission. MR. SMITH, MR. REYNOLDS

171. 172. Economic History of the United States—A survey of American economic history with special attention to such areas as early patterns of trade and commerce, the American industrial revolution, the expansion of the railroads and other common carriers, the growth of heavy industry, changing concepts of business enterprise, the centralization of finance capital, and the adjustment of the United States to the world market. Prerequisite: Hy 3. 4 or permission. *Cr* 3.

MR. HAKOLA, MR. JOHNSON

175. The Negro in American History—The contribution of the Negro in the making of American history. The development of the slave trade, slavery as a system and its abolition, the decline of the rural South, and the growth of the urban ghettos will be discussed. Such special topics as the contributions of black people to the cultural life of the nation will also be treated. Prerequisite: Hy 3. 4. *Cr* 3.

MRS. PEASE

180. Naval History—The influence of sea power on history with major emphasis on the Anglo-American naval tradition since 1950. Naval strategy, tactics, operations and administration will be evaluated during the period of naval growth (1775-1900) and in the subsequent era of the battleship and the fast carrier attack force. Anglo-American naval operations in World War I, World War II, Korea and Vietnam will be specially considered. Prerequisite: Hy 3. 4 or permission. *Cr* 3. MR. REYNOLDS, MR. SEAGER

183. Maritime History—Ships and trade from colonial days to the present. Emphasis will be placed on famous ships and shipbuilders, the evolution of ships from sail and wood to steam and steel, the effect of the Civil War and two world wars on the American merchant marine, and the relationship between the United States Navy and the merchant service. Prerequisites: Hy 3. 4 or permission. *Cr* 3. MR. ALBION

199. Problems in Contemporary History—An analysis in depth of a selected controversial and contemporary historical problem. The topic to be

studied and the method of approaching it will be chosen jointly by interested students and the staff. Prerequisite: permission. *Cr* 3. MR. DOTY AND STAFF

213. Expansion of Europe—Studies of the overseas expansion of Europe from 1450 to 1815. Areas for investigation will include the age of exploration, the foundation of colonial empires, the economic and political ramifications of colonial expansion within and among European states, and the impact of expansion upon non-European peoples. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. ALBION, MR. BATTICK

217. Early Modern England — A consideration and analysis of selected problems, ideas, and institutions of the Tudor-Stuart period of British history. Topics of study will be drawn from such general areas as the growth of parliamentary power, political theory, colonial policy, maritime and naval developments, social and economic changes, and foreign affairs. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. BATTICK

219. Modern England—An evaluation of selected problems in English history since 1815. Among the areas to be treated are the gradual democratization of the British government, the continuing industrial revolution, and the impact of two world wars on English social, cultural and political life. Lectures, readings, class reports, research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. MCCAFFREY

220. The British Empire and Commonwealth Since 1815—Studies in selected problems of British imperial expansion. Areas of investigation will include changing theories of imperial administration, the transplantation of British institutions and culture to the empire, and the conversion of the empire to the Commonwealth. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MISS STEWART, MR. MCANDREW

221. Canadian External Relations — Selected topics in Canadian foreign policy emphasizing relations with the United States. Canada's developing interrelations with other nations, including those of the Commonwealth, will also be studied. Lectures, readings, class reports, and research papers. Prerequisite: Hy 159. 160 or permission. *Cr* 3. MR. MCANDREW

222. Modern France—An evaluation of selected topics in French history from the Bourbon Restoration to the present. Internal political challenges from the Left and the Right in the failure of three monarchies and three republics, the rise and decline of the French empire, economic growth and lag, and French leadership of intellectual movements from Romanticism to Existentialism will be among the subjects investigated. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. DOTY

223. 224. Central European History — An analysis of selected topics in Prussian, Habsburg and Polish history. The first semester will treat various economic, intellectual, political and social movements in the 1648-1848 period. The second semester will be concerned with some of the problems of nationalism, imperialism, revolution and war since 1848 with particular attention to Germany, Poland and the successor states. Lectures, readings, class reports, and research

papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. BLANKE

225. Modern Germany—A consideration of selected aspects of German history since Unification. The emergence of Germany as a great power, the German defeat in two world wars, the problems of the Weimar Republic, the rise and fall of Adolph Hitler and National Socialism, and the recovery of West Germany after World War II will be areas of interest and concentration. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. BLANKE

226. European Social and Intellectual History—An examination of selected topics in the social, intellectual, literary, and cultural development of Europe since the seventeenth century. Particular attention will be paid to the changing views of European intellectuals toward man, his political organization, property relationships and religion. Lectures, readings, class reports, and research papers. Prerequisite: graduate students: senior history majors and others by permission. *Cr* 3. MR. DOTY

229. 230. Economic History of Europe—An evaluation of selected aspects of the European agricultural revolution, feudalism, the rise of towns and guilds, mercantilism, capitalism, and industrialism. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. HAKOLA

233. 234. European Diplomatic History—Specialized studies in the diplomatic history of modern Europe emphasizing the foreign policies of selected major powers and the changing concepts of international relations. The relationship of national power and military power to foreign policy formulation will also be stressed. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. BEITZELL

251. Latin America and the United States—Studies in United States participation and intervention in Latin American affairs from the early 19th century to the Bay of Pigs. Special attention will focus on the development of the Monroe Doctrine, the evolution of the Good Neighbor policy, and the American response to contemporary Latin American revolutionary movements. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. JEFFREY

260. Agricultural History of the United States—An analysis of rural life in America. Selected studies in agricultural techniques, inventions, capitalization, and the rise of agriculture as a business will be undertaken. The relationship of government and agriculture will also be treated. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. SMITH

261. Urban History of the United States—An evaluation of special topics in the rise of the city in America and the development of urban patterns of life. Attention will focus on such subjects as the population shift to the cities, the development of slums and ghettos, the growth of municipal institutions and services, and the relationship of government with city dwellers. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. SMITH

270. Government-Business Relations in American History—Case studies

in such problems as the adoption of a central banking system, federal regulation of railroads, antitrust policy, and the federal government as entrepreneur and as manager of the economy with particular emphasis on the Progressive Era and the New Deal. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3.

MR. JOHNSON

273. 274. American Diplomatic History — Studies in special aspects of American foreign policy since 1775. Emphasis will center on America's roads to war and peace, the problems of maritime neutral rights, territorial and commercial expansion, and the role of military and naval power in foreign policy formulation and execution. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. SEAGER

275. 276. Social and Intellectual History of the United States—A consideration and evaluation of some of the major ideas in American intellectual and cultural history, including such topics as transcendentalism, pragmatism, mission, progress, and revolution. Particular analysis will be given to the interrelationships between ideas and their social environment. Readings, lectures, reports, research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. PEASE

277. 278. War and Society—Special studies in the impact of war on civilization. Emphasis will center on such topics as the philosophy and psychology of war, as well as on the causes, consequences, preparation, and prosecution of war. The techniques of land, sea and air warfare, the relationship of science and technology to war, the literature of war, and the problems of averting war will also be treated. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. REYNOLDS

281. History of the West—A selective analysis of the factors involved in the movement of population westward. Special subjects of study will include the evolution of agricultural and pioneering techniques, the formation and migration of capital on the several frontiers, frontier life and culture, and the influences of territorial and agricultural expansion on American history. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. HAKOLA

285. New England History—Studies in the region as a distinct and unique section of the country. Particular attention will be paid to such transitional movements as the decline and shift in agriculture, lumbering and fishing, the growth of industries, population movement, and the impact of those changes on the political, social and economic structure of the region. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MR. SCHRIVER

286. The South, Old and New, 1820-1900—Studies in selected aspects of the economic, political, and cultural life of the region. Emphasis will be given to the problems of slavery and race, economic development and stagnation, the relationship of sectional politics to national politics, and the myth and reality of Southern culture and literature. Lectures, readings, class reports, and research papers. Prerequisite: graduate students; senior history majors and others by permission. *Cr* 3. MRS. PEASE

[300-level courses are listed in the Graduate School Bulletin]

HONORS PROGRAM (Hr)

PROFESSORS THOMSON (SECRETARY), MILES, BISCOE, FLYNN, GLANVILLE, HARTGEN, HOLMES, NOLDE, C. J. REYNOLDS, SWINFORD; ASSOCIATE PROFESSORS J. BENNETT, REID, SPRAGUE, TREDWELL; ASSISTANT PROFESSORS BANKS, LEMELIN, SCONTRAS; DR. SCHRIVER, MR. MACDONALD

Freshmen of marked academic ability enrolled in all colleges are invited to apply to the secretary for admission to the sequence of honors courses described below. The work of the freshman and sophomore years, under the direction of staff drawn from all colleges of the University, provides the stimulus and the guidance which should enable a superior student to begin building for himself a perspective view of the liberal arts and sciences and to lay a foundation for the more specialized work which is to come. The Honors Program reaches its climax in a thesis which is written during the senior year and treats some limited problem falling in the student's major field. In exceptional cases, students may be admitted at any stage of the Honors Program up to the opening of the junior year. Of the courses listed below, Hr 41, 45, 47, and 48, are taken in common with students from other colleges within the University.

41. Distinguished Freshman Seminar—Students are selected by the Honors Committee. Discussions and demonstrations displaying the rang and nature of the Liberal Arts and Sciences. *Cr* 3. MR. SIMPSON

45. Honors Colloquium—Readings and discussion on the basic concepts of Western civilization. Normally taken in the freshman year. *Cr* 3.

MR. SCONTRAS, Chairman

46. Honors Summer Readings: Basic — Optional for those who have taken course 45. An individually arranged program of readings is independently pursued in the summer. *Cr* 1. MR. REYNOLDS

47. 48. Honors Group Tutorial—Oral and written reports under tutorial direction, upon a planned sequence of books representative of the various fields of liberal education. Hr 47. 48 fulfills the sophomore humanities requirement for those students registered in the Honors Program. *Cr* 3. MR. THOMSON, Chairman

49. Honors Summer Readings: Intermediate—Guided summer readings and reports, individually adapted to the student's program. Primarily for students who have had only one semester from Hr 47. 48. *Cr* 1. MR. SPRAGUE

50. Honors Seminar—Discussion groups in such fields as the arts, philosophy and history of science, aspects of the study of society. Content varies from year to year. Normally taken in the junior year. *Cr* 3.

51. 52. Honors: Specialized Studies — A tutorially conducted study of the student's major field, issuing in the choice of an approved thesis topic. *Cr* 3.

53. 54. Honors Thesis—The planning and completion of an honors thesis or research project. *Cr* 3.

INTERNATIONAL AFFAIRS (Ia)

The study of international affairs may lead to a major in international affairs in any one of the following disciplines: economics, foreign languages or political science. A suggested curriculum for the first two years is outlined below. Detailed programs covering the last two years of study in each discipline may be secured from the Committee on International Affairs, 33 North Stevens, University of Maine, Orono, Maine 04473.

To enter the junior year of the program a student must have a minimum point average of 2.0 or permission of the Committee on International Affairs. Normally a student would take four years of a modern language or its equivalent. He would study in each of the three disciplines.

SPECIMEN CURRICULUM IN INTERNATIONAL AFFAIRS

Freshman Year

FALL SEMESTER			Hours	SPRING SEMESTER			Hours
Eh	1	Freshman Composition or Eh 9, Modern Literature	3	Eh	1	Freshman Composition or Eh 10, Modern Literature	3
Hy	5	Hist. of Western Europe	3	Pol	22	Current World Problems	2
Ms	5	Elements of College Math. or a Laboratory Science	3-4	Hy	6	Hist. of Western Europe	3
				Ms	6	Elements of College Math. or a Laboratory Science	3-4
Pe	1	Physical Education	0	Pe	2	Physical Education	0
Sh	1	Funds. of Public Speaking	3				
		Foreign Language	3			Foreign Language	3
			14-15				14-15

Sophomore Year

Ec	1	Principles of Economics	3	Ec	2	Principles of Economics	3
Pol	1	Introduction to Government	3	Pol	2	Introduction to Government	3
		Descriptive Science	3			Descriptive Science	3
		Foreign Language	3			Foreign Language	3
		Humanities	3			Humanities	3
			15				15

JOURNALISM (Jr)

PROFESSOR HAMILTON; ASSISTANT PROFESSOR MILLER;
PART-TIME INSTRUCTOR KRALL

The department offers a broad, interdisciplinary liberal arts and pre-professional program for students interested in careers in journalism. Its courses are also available and appropriate for any students in the University interested in improving their writing skills or in the study of mass communications as a part of society.

Facilities include a model newsroom, offices for various laboratory publications, a photographic darkroom, and a journalism library. Three student publications (a weekly newspaper, a magazine and a yearbook) are used as journalism laboratories. Students also have access to the University printing plant, a radio station and the facilities of the Educational Television Network. Daily Associated Press wire service is provided. The department will assist students in finding part-time work or in finding summer work.

Major students are required to complete Jr 31.32; 85; 93.94 and 95.96. The major student will round out his program according to one of the options below, designed to provide added understanding of the political, economic and sociological forces operating around him as he pursues a subsequent professional career. Many will elect to continue their training on the graduate level.

Public Affairs Option—For the student preparing for news work in mass communications in the United States, with emphasis on American public affairs. Required courses: Pol 1/2; Ec 1/2; Hy 3.4; plus at least 24 hours of advanced courses in one or two of these social sciences approved by the adviser.

Foreign Affairs Option—For the student preparing for work abroad in mass communications or related activities. The student must complete courses in French, German, or Spanish at least up to the fourth year level. Other required courses: Hy 5/6; Pol 1/2; Pol 135.136; Ec 1/2; plus at least 18 hours in advanced courses approved by the adviser.

Economics Affairs Option — For the student with a special interest in economics, preparing for newspaper work, public relations, industrial editing or related activities. Required courses: Ms 4 and 12 or 5/6; Ec 1/2; and at least 24 hours of advanced economics and related courses approved by the adviser.

Linguistics, Literature and Humanities Option—For the student interested in this broader background as preparation for a writing career. Required courses: Eh 21.22 or Cp 11.12; Eh 7 or 8; one course chosen from Eh 121, 149, and 167; plus at least 12 additional hours in advanced literature and composition courses.

Social Welfare Option—For students preparing for journalism careers with an interest in social welfare, or in the increasing emphasis on sociological research in mass communications, or in a career in social work. Required courses: Pol 1/2, Ec 1/2, Py 1/2, Ay 1/2, Sy 3/4 (as many as possible taken during the sophomore year), plus either of the following plans of advanced courses: Sy 50/51 and 52/53 or Sy 120 and 160, plus six more hours of sociology courses numbered from 10 through 38.

Science Writing Option—Designed to combine liberal arts and a strong science background with journalism training for those interested in this new, specialized field. Prospective majors should elect Ms 12 for their freshman science requirement, and German for the language requirement. The student will be required to complete 32 to 40 hours in a science and the necessary requirements or prerequisites in related sciences.

Courses in Journalism

22. Survey of Journalism—A beginner's course in the structure and operation of modern news media. Includes visit to a modern newspaper plant. Open to all freshmen and sophomores. *Cr* 3. MR. MILLER

25. History of American Journalism—A review of the newspaper's role in American history, and the development of modern mass communications. Open to all sophomores, juniors and seniors. *Cr* 3. MR. MILLER

26. The Press and Society—Not given every year.

31. 32. News Writing—A course in writing and reporting procedures. For the student interested in communicative writing skill generally or as part of a vocational interest. Not open to freshmen. *Cr* 3. MR. MILLER

42. The European Press—Survey of the press of the European nations; its role in political, economic and cultural development. Special emphasis on Germany as the "cradle" of European journalism. *Cr* 3. MR. MILLER

85. Law of Publications—A study of the various legal systems affecting the publishing and broadcasting worlds. Topics include libel, privacy, contempt, copyright, obscenity, censorship, prejudicial pre-trial publicity, and others as they develop within the society. *Cr* 3. MR. HAMILTON

91. Staff Training—On-the-job training during the summer between the junior and senior years. Under the direction of a local editor. *Cr* 3.

93. 94. Advanced Journalism—Intensified writing training; readings and discussions in the ethics and law of journalism. Prerequisite: 31.32. *Cr* 3.

MR. HAMILTON

95. 96. News Editing—A laboratory course designed to acquaint the student with the problems of news selection, copy-editing and so on in the process of publication. *Six hours of class work a week.* Prerequisite 31. *Cr* 3.

MR. HAMILTON

MATHEMATICS (Ms)

PROFESSORS MAIRHUBER, EVES, WOOTTON, AND SWINFORD; ASSOCIATE PROFESSORS NORTHAM, HAMM, TOOLE, CUNNINGHAM, HARPER, DODGE GREEN, HANNULA, MESTECKY, MURPHY, AND POGORZELSKI; ASSISTANT PROFESSORS HOOPER, PERRY, STEARNS, GEIGER, SOULE, DUBE, FARLOW, LOCKE, MORSE, FUENTES, MERRIMAN, BRESINSKY, LANGFORD, AND WOHGELMUTH; INSTRUCTORS MR. WAGNER, MR. BYTHER, MR. MIXER, MR. MERRILL, MRS. BLOOM; GRADUATE ASSISTANTS MR. COYNE, MR. HEATH, MR. HOLMES, MR. SOUKE, MISS ACKLEY, MR. MCCRUM, MISS RAY, MR. SMITH, AND MISS SULLIVAN

Students who plan to major in mathematics will normally take Ms 12 and 27 in their freshman year. For the first semester of the sophomore year, Ms 28 and Ms 122 are recommended, and Ms 124 and one of Ms 29, Ms 29a, Ms 130 and Ms 187 are suggested for the second semester of the sophomore year.

All mathematics majors are required to take the following courses: Ms 12, 27, 28, 122, 124, 171, 173, at least one of Ms 29, 29a, 130 or 187, and at least one of Ms 175, 161, or 197. To satisfy departmental requirements, a student must have at least 39 hours of mathematics, including the aforementioned requirements, and exclusive of Ms 4, 5, 6, 7, 8, 9, 10, 17 and 19. Majors are advised to satisfy the college language requirement in French, German or Russian.

The student's program of elective courses for the junior and senior years will depend upon his vocational plans. In selecting upper level courses, the mathematics major will be assisted by a Mathematics Department member assigned by the department as his adviser. The core of required courses demanded of all mathematics majors has been selected as being necessary for any later work in mathematics.

The general requirements for the master of arts degree are given in the Graduate Catalog. Candidates for this degree in mathematics are expected to have substantial undergraduate training in this subject.

4. Algebra and Trigonometry—The trigonometric functions, their properties and applications. Basic topics in algebra for further work in mathematics. Prerequisite: 2 units H.S. Algebra, 1 unit H.S. Geometry. *Rec* 5, *Cr* 3.

5/6. Elements of College Mathematics—Modern viewpoints on certain basic mathematical material. Intended primarily for non-mathematics majors. *Cr* 3.

7/8. The Structure of Arithmetic—A development of the real number system beginning with the sub-system of natural numbers and generalizing through the systems of integers, rational numbers, and real numbers. Properties of numbers, relations, and operations. Details of numeration systems. Primarily for the elementary school teacher. *Cr* 3.

9. Informal Geometry—Sets, points, lines, planes, and other configurations of one, two, and three dimensional geometry. Congruences, measurement, and constructions. Primarily for the elementary school teacher. Prerequisite: consent of the instructor or teaching experience in an elementary or junior high school. *Cr* 3.

10. Basic Algebra—An introductory treatment of mathematical operations on set symbols including procedures for solving simple equations and inequities. Primarily for the elementary school teacher. Not given every year. Prerequisite: consent of the instructor or teaching experience in an elementary or junior high school. *Cr* 3.

12. Analytic Geometry and Calculus—Equations and graphs, differentiation and integration of polynomials, applications. Prerequisite: trigonometry and the equivalent of Ms 3. *Cr* 4.

17. Mathematical Theory of Investment — Interest, annuities, and their applications. *Cr* 3.

19. Principles of Statistical Inference—An introductory course including such topics as distributions sampling variability, estimation, hypothesis testing and regression. *Cr* 3.

27. Analytic Geometry and Calculus—Conic sections; differentiation and integration of algebraic, trigonometric, logarithmic and exponential functions; applications. Prerequisite: Ms 12 or consent of the department. *Cr* 4.

28. Analytic Geometry and Calculus — Polar coordinates, geometry of three dimensions, infinite series, partial derivatives; multiple integrals; applications. Prerequisite: Ms 27. *Cr* 4.

29. Differential Equations—An introduction to ordinary differential equations; applications. A brief introduction to partial differential equations and Fourier series. Prerequisite: Ms 28. *Cr* 4.

29a. Differential Equations—An introduction to ordinary differential equations; applications. Prerequisite: Ms 28. *Cr* 3.

41. Introduction to Mathematical Logic and the Nature of Proof—An introductory course designed specifically to view logic and the nature of mathematics. Proof with concepts and symbolism as used throughout modern mathematics. The notions and symbolic logic will be developed with a decidedly set-theoretic background. Prerequisite: Ms 21 and Ms 27 or Ms 122. *Cr* 2.

103. Linear Programming I—Formulation of the general linear programming problem, homogeneous and non-homogeneous linear equalities, the simplex method for non-degenerate cases, simplex computational procedure and check concluding slack, surplus and artificial variables, revised simplex procedures, degeneracy and cycling. Prerequisites: Ms 124 or Ms 172, or permission *Cr* 3.

104. Linear Programming II—Duality theory, primal-dual algorithm transportation and transhipment problems, network flows, game theory, optimal strategies, operations research, decision theory, machine assignment, optimal product mix, refinery applications, linear programming and the firm, economic theory applications, closed and dynamic Leontief models. Prerequisite: Ms 103. *Cr* 3.

122. The Structure of the Real Number System — Development of the arithmetic and order properties of the integers, rational, and real numbers. Division algorithm, well-ordering, mathematical induction, fundamental theorem of arithmetic, sequences and series, and consequences of the completeness property of the real numbers. Prerequisite: Ms 27. *Cr* 3.

123. Theory of Equations—Techniques for finding and approximating roots of polynomial equations, synthetic division, factorization of polynomials, solution of linear systems of equations, elementary theory of finite fields. Prerequisite: Ms 122. *Cr* 3.

124. Linear Algebra—An introduction to the theory of vector spaces and linear transformations. Prerequisite: Ms 28. *Cr* 4.

124a. Linear Algebra—An introduction to the theory of vector spaces and linear transformations. Primarily for graduate students. Prerequisite: Ms 28. *Cr* 3.

130. Mathematical Statistics I — Probability and principles of inference. Particular emphasis is given to the normal distribution and related sampling distributions. Prerequisite: Ms 28. *Cr* 3.

131/132. Mathematical Statistics II and III—A continuation of Ms 130 including topics such as decision functions, non parametric methods and an introduction to analysis of variance. Prerequisite: Ms 130 or permission. *Cr* 3.

133. Probability—A brief review of the elements of probability followed by material on random walk, Markov chains and more general stochastic processes. Prerequisite: Ms 130. *Cr* 3.

149. Mathematics for Teachers—A modern approach to selected topics in mathematics with methods of presentation to secondary school students. Prerequisite: Ms 28 or consent of the department. *Cr* 3.

151. Introduction to Vector Analysis and Matrices—The algebra and calculus of vectors. Matrices and systems of linear equations, eigenvalues and eigenvectors, bilinear and other forms. Prerequisite: Ms 28. *Cr* 3.

152. Introduction to Complex Variables—Analytic functions, integration, series, and mapping. Prerequisite: Ms 28. *Cr* 3.

153/154. Partial Differential Equations—An introduction to the general properties of partial differential equations follows by solutions of specific equations. The techniques include eigenfunction expansions, operational methods, and conformal mapping. Prerequisite: Ms 29. *Cr* 3.

161. History of Mathematics—The development of elementary mathematics from ancient to modern times. Prerequisite: Ms 12. *Cr* 3.

165. Theory of Numbers — Elementary properties of the integers. Prerequisite: Ms 122. *Cr* 3.

166. Introduction to Sampling Methods—Basic sampling schemes: simple random, stratified, cluster, and multi-stage. Biases and errors. Ratio and regression estimation. Prerequisite: Ms 19 or Ms 130. Not given every year. *Rec* 2, *Lab* 2, *Cr* 3.

167. Statistical Methods in Research — Analysis of variance, factorials, planned comparisons, analysis of covariance, and multiple regression, viewed as tools for research in all fields. Prerequisite: Ms 19 or 130 or permission. *Rec* 2, *Lab* 2, *Cr* 3.

168. Design of Experiments—Randomization analysis, blocking, and orthogonality; split-plot, factorial, and incomplete-block designs. Examples will be

chosen from a variety of fields. Not given every year. Prerequisite: Ms 167. *Rec* 2, *Lab* 2, *Cr* 3.

169. Computer Programming—Programming logic and techniques. Concentrates on the IBM Fortran language. Student programs will be run on the University's IBM 360 computer. Prerequisite: one year of college mathematics or consent of the instructor. *Cr* 3.

171. Introduction to Abstract Algebra — Algebraic structures, such as groups, rings, integral domains and fields. The theory of groups is emphasized. Prerequisites: Ms 122 and Ms 124. *Cr* 3.

172. Topics in Linear Algebra and Matrix Theory—Advanced topics in the theory of linear algebra and matrix theory. Content varied depending on instructor. Prerequisite: Ms 124 or permission. *Cr* 3.

173/174. Advanced Calculus—Functions of real variables, limits, infinite series, partial differentiation, and other topics. Prerequisite: Ms 122. *Cr* 3.

175/176. Higher Geometry—An introduction to various geometrics, such as projective and non-Euclidean. Not given every year. Prerequisite: Ms 28. *Cr* 3.

179. Finite Groups—Theory of groups, including Sylow's theorems and Abelian groups. Prerequisite: Ms 122 or consent of the department. *Cr* 3.

185. Mathematical Logic—Church's two basic formulations of non-quantified propositional calculus and the elements of quantified propositional calculus. Normal forms. Axiom schemata. Boolean rings and Boolean algebras in logic. Not given every year. Prerequisite: Ms 28. *Cr* 3.

187. Numerical Analysis—Computational methods for electronic computers with exercises on the IBM 360 for interpolation, simultaneous linear algebraic equations, non-linear and polynomial equations, numerical integration, and ordinary and partial differential equations. Prerequisite: Ms 28 and Ms 169. *Cr* 3.

191/192. Differential Geometry—Applications of calculus to the study of space curves and surfaces. Not given every year. Prerequisite: Ms 28. *Cr* 3.

193. Non-Linear Programming I—Introduction to non-linear programming problems, mathematical background review of pertinent linear algebra, convex set theory, linear programming techniques, classical optimization techniques, properties of convex functions, approximation methods for solution of problems involving separable functions, stochastic programming, Kuhn-Tucker theory, and quadratic programming. Prerequisites: Ms 28 and Ms 103. Recommended: Ms 104, Ms 169, Ms 187, linear algebra and permission. *Cr* 3.

194. Non-Linear Programming II—Integer linear programming including sequencing problems, project planning, manpower scheduling, and capital budgeting; gradient methods, Arrow-Hurwicz gradient method for concave programming, dynamic programming including manpower loading and inventory problems, dynamic formulation of transportation problems, equipment replacement problems, combined production scheduling and inventory control problems, Markov processes, optimal pure strategies, and recent developments. Prerequisite: Ms 193. *Cr* 3.

196. Selected Topics in Mathematics—Advanced topics in mathematics not regularly covered in other courses. The content is not fixed but can be varied to suit current needs. The course may, with permission of the department, be taken more than once. Prerequisite: consent of the department. *Cr* 2 or 3.

197/198. Foundations of Mathematics—Fundamentals concepts and methods of mathematics; viewpoints on the foundation of mathematics. Prerequisite: Ms 28 or permission. *Cr* 3.

255/256. Theory of Ordinary Differential Equations — Existence and uniqueness of solutions, nth-order linear equations, linear and non-linear systems, stability, perturbation theory, series solutions, eigenvalue problems and expansion theory. Sturm comparison and oscillation theory, Poincare-Bendixson theory. Prerequisites: Ms 124 and Ms 173 or permission. *Cr* 3.

271/272. Abstract Algebra—The basic structure theorems for groups, rings, fields, and modules. Prerequisite: Two courses from among Ms 124, Ms 171, Ms 172, Ms 179. *Cr* 3.

277/278. Topology—An introduction to fundamental concepts in topology. Topological spaces, continuity, filters, product and quotient spaces, metrization, and other basic concepts are developed. Ms 278 is a continuation of Ms 277 with topics in homotopy theory and fiber spaces added. Prerequisites: Ms 173, Ms 174 or consent of the instructor. *Cr* 3.

‡***279/280. Functions of a Complex Variable*** — Elementary properties of holmorphic functions including the classification of isolated singularities, Laurent expansion and infinite product representations. Also an introduction to conformal mapping and the Riemann Mapping theorem. Prerequisite: Ms 174 or consent of department. *Cr* 3.

†***283/284. Functions of a Real Variable***—Lebesque integration and the elementary properties of Hilbert and Banach spaces. Prerequisite: Ms 174 or consent of department. *Cr* 3.

296. Advanced Topics in Mathematics—Topics not regularly covered in other course work. May be taken more than once with departmental permission. Prerequisite: consent of department. *Cr* 2 or 3.

300. Seminar in Mathematics Education — Oral and written reports on topics in mathematics which have relevance for experimental and new programs in the secondary schools. Restricted to teachers or supervisors, grades K-12, who are candidates for the M.Ed. degree. Prerequisite: permission of the instructor. Not given every year. *Cr* 3.

325/326. Analysis for High School Teachers—A thorough development of the calculus for functions of a single variable. The course is designed to give an experienced high school teacher a proper background in the principles of mathematical analysis. Prerequisite: Ms 122. *Cr* 3.

399. Graduate Thesis—*Cr Ar.*

MODERN SOCIETY (My)

Assistant Professor Scontras (Chairman); Instructor MacDonald

Modern Society (My 1, 2) is an introductory course in social science, designed to acquaint the student with the meaning and use of the scientific method in the study of human relations. It introduces the student to major concepts in the fields of anthropology, social psychology, sociology, economics, and political science. Some attention is given to basic literature and problems in each field.

Basically a general education course, it is designed both for those students who may major in the social sciences and also for those whose chief interests are in other curricula but who need this contribution to a well-rounded education.

Modern Society is open primarily to freshmen in the College of Arts and Sciences. In the other colleges, the course is open to any student who has not had a minimum of two years of social science at the college level.

MUSIC (Mc)

PROFESSORS GODWIN, VERMEL; ASSOCIATE PROFESSORS CAZDEN, JACOBS*; ASSISTANT PROFESSORS CAVANAGH, COLLINS, DAVIS, FOLEY, NESBIT, OPHEIM; INSTRUCTOR MEYER; LECTURER HARE; MRS. COLLINS, MRS. MUMMÉ, MR. NOWICK

The curricula of the Department of Music lead to baccalaureate degrees as follows:

1. ***Bachelor of Arts Degree*** with a major in music

   This program is designed for the study of music within a strong liberal arts curriculum. It offers a broad coverage of the field of music with emphasis upon the study of the history and theory of music. It furnishes an appropriate background for prospective candidates for advanced degrees who are preparing for such careers as musicologists, composers, music librarians, and teachers at the college level. It does not qualify the graduate for certification as a public school music teacher. Candidates for the degree are expected to attain a level of performing ability equivalent to that required at the completion of the sophomore year in the Bachelor of Music program. A senior project is required in lieu of a senior recital.

   Total number of required semester hours in music: 48

Music Theory	20
Music History	10
Performance Emphasis	7
Senior Project	1
Music Organization	4
Music Electives (theory or history)	6
	48

2. ***Bachelor of Science in Music Education***

   This is a four-year professional degree for students in the College of Education who intend to make music a career either as a public school teacher or supervisor of music. Majors in music education will register in the College of Education and follow the curriculum outlined there. The specific requirements for the degree may be obtained from the Department of Music. The degree provides for many professional opportunities and serves also as preparation for graduate study in music education. Upon satisfactory completion of the music education course of study the student is certified to teach both elementary and secondary music. A half-hour recital is required in the junior year.

   Total number of required semester hours in music: 66

Music Theory	22
Music History	10

*On leave of absence 1969-70.

Major performance area	12
Music Organization	7
Instrumental concentration or Vocal-keyboard concentration	15
	66

3. *Bachelor of Music in Applied Music*

This degree is designed to assist the gifted music student to prepare for a career in music performance. Emphasis is placed on performance, music theory, music history, and studies in the liberal arts. The degree is granted in the following applied music areas: Strings, Woodwinds, Brass, Piano, Voice, and Pipe Organ. Graduation requirements include appropriate proficiency in playing or singing, excellent memory and substantial repertoire, and musicianship of a high order. A half-hour recital is required in the junior year, and a full recital in the senior year.

Total number of required semester hours in music: 83

Music Theory	28
Music History	16
Performance Major	16
Performance Minor	8
Music Organization	8
Conducting, Literature	4
Elective in Music	3
	83

A proficiency examination in piano must be passed by all degree students in music before the senior year. See the music adviser for details.

Applied Music Fees

1. For the Music Major:
   No fees will be charged for *required* private instruction.
2. For the non-music major and for instruction *not* required of music majors:
   A fee of $30 per semester will be charged for one 1/2-hour lesson per week; a fee of $60 per semester will be charged for one 1-hour lesson per week. Private instruction for the non-music major and instruction not required for the music major is contingent upon the availability of time of the instructor. Arrangements for such instruction must be made through the office of the music department.

Practice facilities are provided in the music building. The University provides, so far as possible, practice opportunities for students who desire to take applied music without credit.

A fee of $5 is charged for the use of a practice room. After being accepted by a teacher, the student should report immediately to the music office for a fee statement. The lesson fee and rental must be paid to the Treasurer's Office before lessons can begin.

Courses in Music Performance

The Department of Music provides private instruction in various instruments and voice. The student should enroll under one of the following numbers:

* First level,	MC 1-2 *Cr* 1 to 4
Second level,	MC 3-4 *Cr* 1 to 4
Third level,	MC 5-6 *Cr* 1 to 4
Fourth level,	MC 7-8 *Cr* 1 to 4

* The level is roughly the equivalent of the year, but the student who does not meet the requirements for the level at the end of each year as determined by the jury examination will continue on the previous level until the requirements are met. Students will be reviewed at the end of their sophomore year by a jury composed of the faculty of the Department of Music to determine whether they should be advanced to upper level standing in applied music.

Instruction is provided in the following areas. The letter following the instrument, or voice, indicates the area and should be used in conjunction with the numbers above when enrolling.

Example: MC 1 A

Voice	A	Violin	D	Flute	H	French Horn	N	Percussion	U
Piano	B	Viola	E	Oboe	J	Trumpet	P		
Organ	C	Violoncello	F	Clarinet	K	Baritone Horn	R		
		Double-bass	G	Bassoon	M	Trombone	S		
						Tuba	T		

Music majors enroll for two hours credit for the major instrument or voice, one hour for the second instrument or voice. *All other students* enroll for one hour credit.

Courses in applied music and music performance may be repeated for credit.

Each student taking instruction in an applied area must take an examination before a jury of the faculty of music at the end of each semester. Attendance at the Tuesday afternoon student recital is required. Prerequisite: qualifying test; see the Chairman of the Department of Music.

8. Senior Project—A research paper, or original composition, or a lecture-recital presented in lieu of a senior recital. Required of all music majors in the Bachelor of Arts degree program. Accomplished under the guidance of an assigned faculty member during the senior year. *Cr* 1.

Musical Organizations and Ensembles (Mc O)

1. 2. University Singers—Rehearsal and performance of choral concert repertoire. Membership through audition requires sight reading ability. Before requesting an audition the student should take the Music Fundamentals Test (See Secretary of the Department of Music). Four hours of rehearsal a week. Attendance at all rehearsals and public performances required. May be repeated for credit. *Lab* 4, *Cr* 1.

3. 4. Oratorio Society—Rehearsal and performance of major choral works. Membership through audition. Attendance at all rehearsals and public performances required. May be repeated for credit. *Lab* 2, *Cr* 1.

5. 6. Varsity Women's Glee Club—Rehearsal and performance of choral music written expressly for this performing medium. Membership through audition. Attendance at all rehearsals and public performances required. A limited touring organization. May be repeated for credit. *Lab* 2, *Cr* 1.

7. 8. Varsity Men's Glee Club—Rehearsal and performance of choral music written expressly for this performing medium. Membership through audition. Attendance at all rehearsals and public performances required. A limited touring organization. May be repeated for credit. *Lab* 2, *Cr* 1.

11. Band—During football season the band functions as a marching unit; the remainder of the semester is spent in the rehearsal and performance of concert band repertoire. Membership through audition. Attendance at all rehearsals and public performances required. May be repeated for credit. (Fall semester only.) *Lab* 4, *Cr* 1.

12. Concert Band—Rehearsal and performance of standard band repertoire. Membership through audition, or previous participation in Marching Band. Attendance at all rehearsals and public performances required. May be repeated for credit. (Spring semester only.) *Lab* 4, *Cr* 1.

13. Varsity Band—Organized each fall following football season from members of the University Band who are not selected for the Concert Band. *Lab* 2, *Cr* 1.

21. 22. University Orchestra—Rehearsal and performance of symphonic works. Membership through audition. Attendance at all rehearsals and public performances required. May be repeated for credit. *Lab* 4, *Cr* 1.

31. 32. Chamber Choir—The study and performance of chamber music for the voice. May be repeated for credit. *Lab* 2, *Cr* 1.

41. 42. Brass Ensemble—The study and performance of chamber music for brass instruments. May be repeated for credit. *Lab* 2, *Cr* 1.

45. 46. Woodwind Ensemble—The study and performance of chamber music for woodwind instruments. May be repeated for credit. *Lab* 2, *Cr* 1.

49. 50. String Ensemble—The study and performance of chamber music for string instruments. May be repeated for credit. *Lab* 2, *Cr* 1.

Courses in Music Education (Mc E)

1. Music Methods for the Elementary Teacher—A functional course covering the methods, content, and materials of the elementary music program. Prerequisite: Mc L 1, and MC T 1 or equivalent. (*Offered only during academic year 1969-70 for those elementary education majors who have previously taken Mc T1. See Mc E5-6*). *Cr* 3.

3. Teaching and Supervision of Public School Music—Methods, materials, organization and administration of the music curriculum in the public schools. Prerequisite: MC T 14 A, B, and MC L 22. *Cr* 3.

5-6. Music for the Elementary Classroom Teacher—Basic musicianship and approaches to the musical training of the elementary school child. Emphasis is placed upon the achievement and utilization of elemental performance skills in the areas of singing, rhythmic movement, aural analysis, composition, improvisation and instrumental techniques. *Lec* 1, *Lab* 2, *Cr* 2. Required of all elementary education majors.

21. Teaching of General Music—Organization and teaching of general music classes in the junior high school. Prerequisite: MC E 3, or equivalent. *Cr* 3.

Courses in Performance Techniques (Mc P)

1/2. Voice Class—The systematic development of the principles of good singing for beginners in voice. Prerequisite: MC T 1 or passing of Music Fundamentals Test. *Lab* 2, *Cr* 1.

5/6. Piano Class—A class designed to give a basic command of the keyboard to those students who need it as a tool. Recommended especially to those students who are required to take a proficiency examination in secondary piano and who lack the basic keyboard skills. Prerequisite: MC T 1, or passing of Music Fundamentals Test. *Lab* 2, *Cr* 1.

‡***9/10. String Class***—Basic skills pertaining to each of the four string instruments. First semester, study of all instruments; second semester, concentrated work on one instrument. Prerequisite: MC T 1, or passing of Music Fundamentals Test. First semester: *Lab* 4, *Cr* 2; second semester: *Lab* 2, *Cr* 1.

†***13. Woodwind Class***—Basic skills pertaining to the woodwind instruments. Prerequisite: MC T 1, or passing of Music Fundamentals Test. *Lab* 4, *Cr* 2.

†***17. Brass Class***—Basic skills pertaining to the brass instruments. Prerequisite: MC T 1, or passing of Music Fundamentals Test. *Lab* 4, *Cr* 2.

‡***21. Percussion Class***—Basic skills pertaining to the percussion instruments. Prerequisite: MC T 1, or passing of Music Fundamentals Test. *Lab* 2, *Cr* 1.

41. Choral Conducting and Literature—Advanced choral conducting, and study of basic problems in the organization and training of choral groups. Prerequisite: MC H 2. *Lec* 2, *Lab* 3, *Cr* 3.

45. Instrumental Conducting and Literature—Advanced instrumental conducting, and study of basic problems in the organization and training of bands and orchestras. Prerequisite: MC H 2. *Lec* 2, *Lab* 3, *Cr* 3.

51. 52. Accompanying—A course designed for music majors whose concentration is voice-keyboard. Prerequisite: MC 2B or C. *Lab* 2, *Cr* 1.

Courses in Music History (Mc H)

1/2. History of Western Music—The history of music from antiquity to the present day with a technical study of the significant musical trends. Prerequisite: For the major, MC L 22, or sophomore standing. For the general student, permission of the instructor. *Cr* 3.

117. Music of the Baroque Period—A study of music in the 17th and first half of the 18th centuries; from Monteverdi and Schütz to Bach and Handel. Prerequisite: MC H 2, or permission of the instructor. *Cr* 3.

119. Music of the Classical Period—The changing style in form and content as evolved by Haydn, Mozart and Beethoven viewed against the background of social and political conditions of the time. Prerequisite: MC H 2, or permission of the instructor. *Cr* 3.

121. Music of the Romantic Period—Study of musical expression during the 19th century with emphasis on the intellectual foundations of the romantic movement. Study and detailed analysis of representative works from Beethoven through Debussy. Prerequisite: MC H 2, or permission of instructor. *Cr* 3.

123. Music of the Twentieth Century—Trends in contemporary music and their relationship to the cultural and political life of our time. Prerequisite: MC H 2, or permission of the instructor. *Cr* 3.

Courses in Music Literature (Mc L)

1. Understanding Music—A study of the basic elements of music necessary for intelligent listening, with emphasis on the various historical movements, together with a study of the great composers and their contrasting styles as exemplified by their most important compositions. For the general student. *Cr* 3.

3. Vocal Literature—A survey through discussion and performance of vocal literature from the 18th century to the present day to include classic Italian songs, German Lieder, French art songs, and contemporary American and British songs. *Cr* 1.

5. Woodwind Literature—A survey through discussion and performance of woodwind literature to familiarize the student with the standard repertory. *Cr* 1.

7. Brass Literature—A survey through discussion and performance of brass literature to familiarize the student with the standard repertory. *Cr* 1.

9. String Literature—A survey through discussion and performance of string literature to familiarize the student with the standard repertory to include that composed for string quartet. *Cr* 1.

11. Piano Literature—A survey through performance and discussion of standard literature for piano. *Cr* 1.

13. Organ Literature—A survey through discussion and performance of standard literature for organ. *Cr* 1.

21-22. Survey of Music Literature—A comparative study of styles, characteristics, forms, and performing mediums of music from the Renaissance to the present. Primarily for music majors. *Cr* 2.

Courses in Music Theory (Mc T)

1. Fundamentals of Music—Notation and terminology, scales and intervals, chords, ear training, elementary rhythmic and melodic dictation, sight-singing. Open to all students. Required of music majors at no credit for those failing to pass the Music Fundamentals Test. *Cr* 3.

11A/12A. Elementary Harmony—Four-part harmony in diatonic relationships. To be taken concurrently with MC T 11B/12B. Prerequisite: MC T 1 or passing of Music Fundamentals Test (see secretary of the Department of Music). *Cr* 3.

11B/12B. Elementary Sight Singing and Ear Training—Sight singing, ear training, dictation, and keyboard work. To be taken concurrently with MC T 11A/12A. Prerequisite: MC T 1, or passing of Music Fundamentals Test (see secretary of the Department of Music). *Lab* 2, *Cr* 1.

13A/14A. Advanced Harmony—A continuation of MC T 11A/12A. Function and use of the seventh, ninth, eleventh and thirteenth chords, chromatic harmony, and advanced modulation. To be taken concurrently with MC T 13 B/14 B. Prerequisite: MC T 12 A. *Cr* 3.

13B/14B. Advanced Sight Singing and Ear Training—A continuation of MC T 11B; 12B. To be taken concurrently with MC T 13 A/14 A. *Lab* 2, *Cr* 1.

15/16. Form and Analysis—Harmonic and structural analysis of musical forms from the smallest to the largest. Prerequisite: Mc T 13A/14A, or the equivalent. *Cr* 2.

†***21. Modal Counterpoint***—Contrapuntal techniques as practiced by com-

posers of the 16th and 17th centuries. Written exercises and analysis. Prerequisite: MC T 11A/12A, or permission of instructor. *Cr* 2.

‡***22. Tonal Counterpoint***—Contrapuntal techniques as practiced by composers of the 18th and 19th centuries. Written exercises and analysis. Prerequisite: MC T 11A/12A. *Cr* 2.

55/56. Canon and Fugue—Analysis of masterpieces in forms, with particular concentration on the canons and fugues of Bach. Composition projects in these polyphonic types. Prerequisite: MC T 13B/14B, and MC T 22, or its equivalent. *Cr* 2.

‡***151. Instrumentation and Arranging***—Study of the ranges, tonal possibilities, technical limitations, and transpositions of all orchestral and band instruments; scoring of short pieces for band, orchestra and ensembles. Prerequisite: MC T 11A/12A. *Cr* 2.

‡***161. Composition I (Small Forms)***—Creative writing in the smaller forms including harmonic textures and use of contrapuntal devices. Prerequisite: A working knowledge of harmony and counterpoint and permission of the instructor. May be repeated for credit. *Cr* 2.

†***163. Composition II (Large Forms)***—Continuation of MC T 161. Creative writing for voice and instruments in the larger forms. Prerequisite: MC T 161. May be repeated for credit. *Cr* 2.

THE SCHOOL OF NURSING

PROFESSOR MACLEAN; ASSOCIATE PROFESSOR IVANISIN; ASSISTANT PROFESSORS CAMPBELL, CARROLL, COTTON, HAMILTON, JENSEN, ROSCOE, TRYON; INSTRUCTORS MRS. ELLIS, MISS MADDOX, MRS. RICH; COOPERATING WITH THE FACULTY: MISS DOLAN, MISS SULLIVAN, MISS TANKEVICH

The School of Nursing was established in 1958 through a gift from Congresswoman Frances Payne Bolton of Ohio. The school, a division of the College of Arts and Sciences, offers a four-year program which combines liberal arts and professional nursing education.

The philosophy of the School of Nursing encompasses and extends the philosophy of the University of Maine and of the College of Arts and Sciences, of which it is a part. The curriculum of the School of Nursing is based on the philosophy that professional nursing education should prepare an individual who will make a positive contribution to the welfare of the community through the effective practice of nursing in a changing world and who will achieve both personal and professional satisfaction.

The professional education is built on the knowledge, discipline and cultural understanding acquired through study of the arts and sciences. The curriculum provides an opportunity for the student to develop ability in critical thinking and communications, an understanding of human needs, a knowledge of the characteristics of health and its deviations, and the skill necessary to use all of these in the nursing care of people of all ages.

The total program is planned to prepare the graduate to practice professional nursing in a beginning position in the community, home, hospital or extended care facility and to work with individuals, families, and other groups. It is also designed to provide a basis for advancement to the responsibilities of leadership

positions and for graduate study in the nursing field as well as acceptance of civic responsibility for promoting community health and welfare.

The first two years of the program are based on the Orono campus and consist largely of the general education courses which provide a foundation for the clinical courses of the junior and senior years. These are taught in Portland and other clinical areas.

The course requires eight full semesters, plus a summer session between the sophomore and junior years. Upon satisfactory completion of the course, students receive the bachelor of science degree and are eligible to take State Board Examinations for licensure as registered nurses.

The student in the School Nursing, as a regularly enrolled undergraduate in the University, is entitled to use all facilities of the University for study, scholarship aid, and extracurricular activities.

The Maine Medical Center in Portland and a psychiatric hospital provide the clinical fields for the major portion of the nursing courses. Field experience in public health nursing is provided through cooperation with the Division of Public Health Nursing of the State of Maine, Department of Health and Welfare, and the Portland City Health Department.

Fees and expenses will be essentially the same as those of other students for all four years, with the addition of the summer session, and nursing uniforms ($90) which are purchased during the spring of the sophomore year.

Dormitory facilities are provided by the University, both on the Orono campus and in Portland. Special living arrangements are made during the course in public health nursing if the assignment requires it.

The student must provide herself with a car for public health nursing experience and must pay the cost of this. She must have a driver's license current in some state in order to register for the senior year.

In order to enter the junior year of the program the student must have a minimum accumulative average of 1.8.

The School of Nursing reserves the right to request the withdrawal of any student who fails to make satisfactory adjustment to the field of nursing.

Courses in Nursing (Nu)

1. Introduction to Nursing—A survey of the expanding responsibilities and functions of the professional nurse in contributing to the health of the individual, the family, and the community, with emphasis on the changing health problems. *Cr* 2. MRS. HAMILTON

2. Introduction to Nursing—The historical interrelationship of social, cultural, and health factors of civilization with the development of nursing and nursing education. *Cr* 2. MRS. HAMILTON

3. Fundamentals of Nursing—An introduction to the nursing care of patients. Guided learning in selected nursing activities is provided through lectures, seminars and laboratory and clinical experience. Emphasis is placed on the development of nurse-patient relationships. *Cr* 3. MRS. CARROLL AND STAFF

4. Community Health—The health and welfare needs of individuals and families and community attempts to meet them. It includes some of the essentials of promoting health and preventing disease and stresses the role of the health worker in community health organization. Field trips to local agencies are arranged. *Cr* 3. MRS. CAMPBELL

5. Nursing of Adults—Provides the student with the knowledge and skills necessary to care for adults with acute and chronic illnesses and to assist in preparing the hospitalized patient to return to the community. Emphasis is placed on the patient's individuality, the interrelatedness of the physical and the psychological, the cooperation among members of the health team and further development of nursing skills. Guided clinical experiences are provided. *Cr* 12.

MRS. CARROLL AND STAFF

6. Nursing of Mothers and Children—A total family-centered approach to nursing needs of mothers and children. Guided experience in the field of maternal and infant care and care of the child. Study emphasizes the normal mother and infant and the effect of the ill child on the family. Community resources needed to meet the needs of families during the child rearing and child bearing periods are explored. *Cr* 12. MISS TRYON AND STAFF

9. Community Health Nursing—Concepts and selected experiences essential to the understanding of the principles, scope, trend, organization and administration of nursing in community health agencies. *Cr* 6.

MISS ROSCOE AND STAFF

10. Psychiatric Nursing—Symptomatology and treatment of mental illness. Principles of dynamic psychiatry. Guided experience in the nursing care of selected patients. Community aspects are included. *Cr* 6.

MISS COTTON AND MISS MADDOX

13. Comprehensive Nursing—Provides opportunities for integrating knowledge and skills in ministering to individual patients with complex health problems and in assuming the responsibility for the nursing care of a group of patients. Provides also for the greater development of skills in organization and management of nursing care and in teaching. *Cr* 12.

MRS. CARROLL AND STAFF

15. Introduction to Pharmacology—An orientation to pharmacology including study of legislation and the ways in which drugs are prepared, administered and act. *Cr* 1. MRS. HAMILTON

18. Seminar in Nursing—Study of current problems of the profession. *Cr* 2. MISS IVANISIN

CURRICULUM IN NURSING

FRESHMAN YEAR

Bc	7	Fundamentals of Chemistry	4
Bc	8	Elem. Physiological Chemistry	4
Eh	1	Freshman Composition	3
Eh	9 or 10	Modern Literature	3
Nu	1.2	Intro. to Nursing	4
Pe	1.2	Physical Education	0
*Py	1/2	General Psychology	
		or	
*Sy	3/4	Intro. to Sociology	
		or	
		** Elective	6
Zo	3	Animal Biology	4
Zo	10	Anatomy and Physiology	5
			33

SOPHOMORE YEAR

By	21	Intro. to Bacteriology	3
By	21A	Laboratory	1
Fn	152	Human Nutrition	3
Nu	4	Community Health	3
Nu	15	Intro. to Pharmacology	1
*Py	1/2	General Psychology	
		or	
*Sy	3/4	Intro. to Sociology	6
Sh	1	Public Speaking	3
		**Electives	12
			32

SUMMER SESSION

Nu	3	Fundamentals of Nursing	3

JUNIOR YEAR				SENIOR YEAR			
Nu	5	Nursing of Adults	12	Nu	9	Public Health Nursing	6
Nu	6	Nursing of Mothers & Children	12	Nu	10	Psychiatric Nursing	6
Py	123	Psychology of Childhood	3	Nu	13	Comprehensive Nursing	12
		Elective	3	Nu	18	Nursing Seminar	2
			30			Elective	3
							29

* Py 1/2 and Sy 3/4 are required and must be taken either in the freshman or sophomore year.
** Chosen from the humanities and social sciences. Humanities requirement must be met.

PHILOSOPHY (Pl)

PROFESSORS HJELM AND VIRTUE; ASSOCIATE PROFESSORS SKORPEN AND TREDWELL (CHAIRMAN); ASSISTANT PROFESSORS WARNE AND WEBER; LECTURERS MRS. BOMBARD, DR. WEISZ

Philosophy, man's search for basic understanding of himself, his culture, and his world, has always been both a generous critic and a dissatisfied goal-maker for liberal education. As a critic, it offers insight into intellectual method and the procedures of judgment and evaluation; as a goal-maker, it seeks the union of theory and practice through immediate participation in cultural processes themselves.

Twelve courses in the department are open without prerequisite. They are Pl 1.2, Philosophy and Modern Life; the four courses in the history of philosophy (101-104); Ethics (111); Existentialism (121); Logic (131); Philosophy of Science (141); Introduction to Biblical Thought (161); Religions of the East (163); and Western Religious Thought (164). Other courses in the department require one or two semesters of philosophy as prerequisite.

Philosophy majors take 24 hours in the department, exclusive of Pl 1.2.

1. 2. Philosophy and Modern Life—An introduction to philosophical thinking through an examination of contemporary spokesmen on ethics, religion, education, and politics and a critical comparison of their ideas with those of major philosophers of the Western tradition. Representative topics are: classic and contemporary views of social justice; egoism and unselfishness; tradition and the formation of the present. Primarily for freshmen and sophomores. First semester, MR. TREDWELL AND MR. WEBER. Second semester, MR. SKORPEN AND MR. WARNE. *Cr* 3.

70. Perspectives in Culture—The interrelations of the sciences and the arts in contemporary culture. For seniors in practice teaching only. Not offered in 1969-70.

100. Readings in Philosophy—Individual study of a selected topic, agreed upon by the student and instructor. *Cr* 1-3. STAFF

History of Philosophy

‡***101. History of Ancient Philosophy***—From the earliest Greeks through the Romans, with central emphasis on Plato and Aristotle, and including the Epicureans and Stoics. *Cr* 3. MR. WEBER

‡*102. History of Mediaeval Philosophy*—The development of thought from the confluence of Greco-Roman philosophy with the Judaic, Christian, and Islamic traditions to the philosophies of the High Middle Ages. *Cr* 3. MR. WEBER

†*103. Early Modern Philosophy*—The emergence of rationalism and empiricism on the continent and in the British Isles. A study of representative chief thinkers from Descartes and Bacon to Hume. Next offered in 1970-71. *Cr* 3.

†*104. Late Modern Philosophy*—The philosophy of Kant and later idealism and other representative philosophers such as Comte, Mill, and Spencer in the 19th century. Next offered in 1970-71. *Cr* 3.

107. American Philosophy—A brief examination of colonial and early 19th century American contributions to the development of present-day philosophy. Particular emphasis will be given to the philosophical views of Royce, Peirce, James, Dewey and Santayana. Prerequisite: one course in philosophy. Not offered in 1969-70. *Cr* 3.

108. Philosophical Classics— An intensive study of the works of a major philosopher or school. This course is conducted in seminar style, and ordinarily treats intensively a philosopher or school of the period considered by the history of philosophy course in the preceding term. Prerequisite: one course in philosophy or consent of the instructor. First semester: Hegel and Schopenhauer, MR. SKORPEN. Second semester: Aristotle, MR. WEBER. *Cr* 3.

Value Theory

111. Ethics--An introductory inquiry into problems of the good life and of right and wrong action. Classical moral theories, such as those of Aristotle, Hume, Kant, and Kierkegaard, are examined and discussed in the light of contemporary ethical and meta-ethical issues. *Cr* 3. MR. SKORPEN

113. Aesthetics—Analysis of aesthetic experience and value. Various theories and interpretations, classical and contemporary, of the nature of beauty, feeling, and the arts are studied. Prerequisite: one course in philosophy or consent of the instructor. *Cr* 3. MR. WARNE

Philosophy of Man

121. Existentialism—Subject matter of the course is viewed in historical perspective to the perennial philosophical questions of human identity, individual purpose, existential courage, etc. Concepts of despair, alienation, tragic heroism, bad faith, authenticity, shipwreck and recovery are explored in the writings of such men as Kierkegaard, Nietzsche, Camus, Sartre, Heidegger, and Jaspers. *Cr* 3.
MR. SKORPEN

123. Philosophical Anthropology—Speculation about human nature has led Western philosophers to draw wide-ranging conclusions for ethics, aesthetics, political philosophy and philosophy of education. This course examines these views in detail, treating such writers at Plato, Aquinas, Dewey, Cassirer and Sartre. Prerequisite: one course in philosophy or consent of the instructor. *Cr* 3.
MR. TREDWELL

Logic and Formal Studies

131. Logic I—An introductory course in modern symbolic logic. Techniques of deductive inference, including decision procedures and axiomatization, are

studied in developing the propositional and predicative logics. Some attention, as time permits, is given to metalogic and the philosophy of logic. *Cr* 3. MR. WARNE

132. Logic II—A course in advanced topics in symbolic logic. Topic for second semester, 1969-70: modal logic—an investigation of the semantical and syntactical features of modal logic and their relationship to issues in ethics, epistemology, and religion. Prerequisite: Pl 131 or consent of the instructor. *Cr* 3.
MR. WARNE

Philosophy of Science

141/142. Philosophy of Science—A critical examination of the conceptual and experimental procedures scientists employ in formulating and evaluating their theories. Readings from scientists' writings and from contemporary philosophers of science. Pl 142 is not offered in 1969-70. *Cr* 3. MR. TREDWELL

Topics in Philosophy

153. Philosophy of History—A critical examination of the problem of historical knowledge, and of major speculative contributions to the interpretation of history. Readings will include Hegel, Marx, Spengler, and Toynbee. Prerequisite: one course in philosophy or consent of the instructor. Not offered in 1969-70. *Cr* 3.

154. Epistemology—Concentrating on the theory of knowledge since Kant, this course examines such topics as: the sense-data theory of the origin of knowledge; the relation of language to theories; and the methods by which claims to know are supported or dismissed. Prerequisite: one course in philosophy. *Cr* 3. MR. TREDWELL

155. Metaphysics—A study of traditional and contemporary views on the nature of reality. Historical treatment of representative metaphysicians of the past forms the basis for an examination of the categories and tenets of present-day metaphysicians. Prerequisite: one course in philosophy or consent of the instructor. *Cr* 3. MR. WEBER

156. Philosophy of Religion—A philosophical study of religion, with emphasis on such topics as revelation and reason, religious language and the Divine existence as they have been dealt with in classical and contemporary thought. Prerequisite: one course in philosophy or consent of the instructor. *Cr* 3. MR. HJELM

159. Topics in Philosophy—Individual and small group study of problems or systems of philosophical concern. The course is conducted in seminar style, and, relying on careful use of major philosophical resources, attempts fresh exploration of fundamental topics. Topic for first semester, 1969-70: The existence of God. A critical examination of the major proofs for the existence of God and their role in theological and philosophical discourse; MR. WARNE. Topic for second semester. Philosophy of Education; MR. SKORPEN. Prerequisite: two courses in philosophy or consent of the instructor. *Cr* 3.

Religious Thought

161. Introduction to Biblical Thought—An introduction to the historical, literary and theological development of the Biblical tradition from the time of the Hebraic origins to the period of the emergence and expansion of the Christian community. *Cr* 3. MR. HJELM

163. Religions of the East—A study of the principal living religions of India, the Far East and the Middle East in their historical development with special emphasis on theological, literary and cultic characteristics. *Cr* 3. MR. HJELM

164. Western Religious Thought—An examination of the main developments of the Judeo-Christian tradition from the first to the 17th century. Special emphasis is given to the reading of primary sources from the Christian tradition. *Cr* 3. MR. HJELM

169. Topics in Religion—Individual and small-group study of problems and issues in religious thought. Conducted in seminar style, this course undertakes detailed examination of topics of present interest to students of religion. Since its content varies from term to term, Pl 169 may be repeated for credit. *Cr* 3. MR. HJELM

PHYSICS AND ASTRONOMY

PROFESSORS CAMP (CHAIRMAN), BENNETT, BISCOE, CARR, AND KRUEGER; VISITING PROFESSOR NELSON; ASSOCIATE PROFESSORS COFFIN, EDGERTON, HARMON, AND TODD; ASSISTANT PROFESSORS BROWNSTEIN, CLARK, HESS, ROCKMORE, SMITH, AND TARR; INSTRUCTORS, MR. R. H. LITTLEFIELD, MR. R. G. LITTLEFIELD; GRADUATE ASSISTANTS MR. BURKE, MR. EPSTEIN, MR. FULLER, MISS LODGE, MR. MCLEMORE, MR. PARKER, AND MR. WHITTEN

ASTRONOMY (As)

9. *Descriptive Astronomy*—An elementary course emphasizing the principles of this natural science. Lectures are supplemented by demonstrations in the planetarium and the observatory. *Cr* 3.

14. Navigation—The compass, piloting, dead reckoning, the sailings, celestial navigation. Prerequisite: trigonometry. Not given every year. *Cr* 3.

15/16. General Astronomy—A more complete treatment of the subject than is possible in As 9. Prerequisite: one year of college mathematics. *Cr* 3.

59/60. Advanced Astronomy—Spherical trigonometry; determination of time, latitude, longitude; celestial mechanics, artificial satellites, interplanetary flight; eclipses; stellar parallax, motions, structure; binary stars, sizes and masses. Prerequisite: Ms 28 or permission. Not given every year. *Cr* 3.

PHYSICS (Ps)

The department offers major work leading to the degree of bachelor of arts in physics in the College of Arts and Sciences, and also major work leading to the degree of bachelor of science in engineering physics in the College of Technology.

The following courses should be taken by all candidates for the B.A. degree: Ps 1/2 (or 1a/2a), 17, 18, 36, 153, 155, 172, 176, along with Ms 12, 27/28, 29.

A minimum of 35 credit hours in physics is required although in special cases a course in another department may be substituted for a physics course. In addition, Ch 13/14 and further courses in mathematics are recommended. Any program of study must be approved by the department.

Prospective physics majors should take Ms 12 and Ms 27 and, if possible,

Ps 1/2 (or Ps 1a/2a) in the freshman year. If not prepared for Ms 12, a student should elect Ms 4 and, if taking physics concurrently, should take Ps 1a/2a.

The following courses of the more descriptive variety are open to all students and have no prerequisite: Ps 3, 9, 10, 31.

1/2. General Physics—The fundamentals of mechanics, matter, sound, heat, electricity, magnetism, light, and modern physics. The course meets the needs of engineering and science students. Calculus will be used. *Lec* with *Dem* 2, *Rec* 1, *Lab* 3, *Cr* 4. MR. BENNETT AND STAFF

1a/2a. General Physics—The fundamentals of mechanics, sound, heat, electricity, magnetism, light, and modern physics. Similar to Ps 1/2 but with less emphasis on computations and more emphasis on discusion and graphical methods. Calculus is not used. *Meets the needs of predental and premedical students. Lec* with *Dem* 2, *Rec* 1, *Lab* 2, *Cr* 4. MR. BISCOE AND STAFF

3. Descriptive Physics—For the non-science student. A treatment in non-mathematical language of the more important topics in physics. Designed to develop an appreciation for the concepts, vocabulary, and methods of the science rather than a false sense of mastery. *Lec with Dem* 3, *Cr* 3.

MR. BENNETT AND MR. TODD

6. Essentials of Physics—A one-semester general physics course designed primarily for students from the College of Life Sciences and Agriculture. A condensation of Ps 1/2 accompanied by a careful selection of the topics treated. *Lec* with *Dem* 3, Lab *with Discussion* 4. *Cr* 5.

9. Climatology—An introduction to general climatology, treating the elements and controls of climate, climate classification, and various relationships between climate and other natural phenomena and human activities. No prerequisite. *Rec* 3, *Cr* 3. MR. TODD

10. Meteorology—The earth's atmosphere, composition, and movements. Atmospheric conditions accompanying changes in weather, and weather predictions. Air-mass analysis. The course may be followed by Course 161. *Rec* 3, *Cr* 3.

MR. TODD

17. 18. Intermediate Physics—A more mathematical treatment with the calculus of many of the topics in Courses 1/2 or 1a/2a, either of which is a prerequisite. (With special permission, students may register for this course under the number Ps 17a. 18a without laboratory *for three credit hours.*) *Lec* 2, *Comp* 2, *Lab* 2, *Cr* 4. MR. COFFIN AND OTHERS

31. Photography—Fundamental theories and techniques. For the scientist and the amateur. Characteristics and use of various types of cameras, lenses, exposure and exposure meters, emulsions, filters, artificial lighting and copying contact and projection printing, dark-room practice. *Rec* 2, *Lab* 2, *Cr* 3. MR. TODD

36. Introductory Modern Physics for Engineers—Selected topics in molecular, atomic, electronic, and nuclear physics, intended to meet the needs of the present-day engineering student. College physics, calculus, and some chemistry are prerequisite. *Lec* 2, *Rec* 1, *Cr* 3. MR. CLARK

153. Electrical Measurements—A third-year laboratory course covering theories and practices in the measurement of electrical and magnetic quantities. *Lab* 4, *Cr* 2. MR. HARMON, MR. TARR

155. Electricity and Magnetism—An advanced treatment of the fundamental aspect of electrostatics, magnetism, electromagnetic phenomena, direct and alternating currents. Prerequisite: Ps 18 or permission. *Rec* 3, *Cr* 3. MR. BISCOE

161. Advanced Meteorology — A more thoretical treatment than Course 10, combined with which the meterology requirement for government service is satisfied. Not given every year. *Rec* 3, *Cr* 3. MR. TODD

162. Heat and Thermodynamics—The laws of thermodynamics. Thermodynamic description of the properties of matter. *Rec* 3, *Cr* 3.

163. Statistical and Thermal Physics—Emphasizes the principles and methods of statistical mechanics as a foundation for classical thermodynamics. Elementary statistical mechanics applied to systems of current interest. Quantum statistics and non-equilibrium theory considered as time permits. Prerequisites: Ps 17, 18, 36. *Rec* 3, *Cr* 3.

166. Physical Electronics—Electronic ballistics, electronic emission, high-vacuum, solid state, and gaseous electronics. *Rec* 3, *Cr* 3.

169. Atomic Physics—Atomic and molecular physics. Includes atomic structure, X-rays, quantum concepts and spectroscopy. Prerequisite: Ps 36 or permission. *Rec* 3, *Cr* 3. MR. TARR

170. Nuclear Physics—Basic concepts, radioactivity, nuclear reactions, alpha-beta and gamma-decay. A more specialized course than Ps 169. *Rec* 2, *Cr* 3, *if taken with laboratory or Cr* 2 *if taken without laboratory*. MR. HESS

172. Optics—A practical study of geometric optics including ray tracing, aperture limitations, light sources and recievers, photometry and color. *Rec* 3, *Cr* 3. MR. BENNETT

176. Physical Measurements—A third-year laboratory course in which experiments are selected from various branches of physics. *Lab* 4, *Cr* 2. MR. TARR

181. 182. Advanced Laboratory Physics—Selected advanced experiments and projects in the field of physics, for senior students. Opportunity is given to develop original ideas and to construct apparatus. Departmental approval required. *Lab* 6, *Cr* 3. STAFF

186. Introduction to Quantum Mechanics—Concepts of quantum theory. The Schrodinger equation and its solution for simple physical systems. Perturbation theory. Prerequisite: Ps 169, and differential equations. *Rec* 2, *Cr* 2. MR. BROWNSTEIN

191. 192. Mathematical Physics—An advanced theoretical course which deals with the mathematical aspects of physics. Mathematics is treated as a tool in the analysis of physical problems. Analytical mechanics is emphasized the first semester; topics are selected from the whole field of physics in the second semester. *Rec* 3, *Cr* 3.

193. Topics in Physics—A course primarily for undergraduates dealing with selected topics in areas not already covered by regular course offerings in the department. Given on demand. *Cr Ar.* STAFF

196. Physics of Materials—Relates the commonly observed macroscopic properties of materials to the microscopic process from which they result. Electrical, magnetic, optical, and mechanical properties will be discussed. Prerequisites Ps 36, Ps 155 Ms 29. *Rec* 3, *Cr* 3.

198a. 198b. Physics Seminar—Oral and written reports on approved topics. Primarily for seniors. *Sem* 1, *Cr* ½. MR. BENNETT

199. Problems in Physics—A thesis project primarily for undergraduates and ordinarily of an experimental nature. *Cr Ar.* (1-3). STAFF

201. Mechanics—Kinematics and dynamics of rigid body motion using the Lagrange formulation of the equations of motion. Linear transformation theory

and Hamiltonian mechanics. Hamilton-Jacobi theory and applications. Prerequisite: Ps 191 or equivalent. *Rec* 3, *Cr* 3. MR. EDGERTON

205. Modern Physics—The fundamental principles underlying present-day modern physics for beginning graduate students. Includes an introduction to quantum mechanics as a basis for more specialized courses. Prerequisite: an undergraduate course in Modern Physics or its equivalent, and mathematics through ordinary and partial differential equations and vector analysis. *Rec* 3, *Cr* 3. MR. CARR

212. Electrodynamics I—Basic properties of the electromagnetic field and its propagation in isotropic and anisotropic media, guided propagation and stationary wave fields. Interactions between the electro-magnetic field and matter are examined. Prerequisite: Ps 192 or its equivalent, and mathematics through partial differential equations, vector analysis and elementary complex variable theory. *Rec* 3, *Cr* 3. MR. KRUEGER

218. 219. Methods of Theoretical Physics—Topics selected to strengthen the background in theoretical physics required of Ph.D. students. These may include applications of Green's function methods, integral equations, variational methods, finite dimensional vector spaces, complex variable, conformal mapping, distribution theory, and group theoretic techniques. The level is that of *Methods of Theoretical Physics* by Morse and Feshbach. Prerequisite: Ps 192 or equivalent. *Rec* 3, *Cr* 3.

220. Quantum Mechanics I—The physical concepts and mathematical methods currently used on problems dealing with atomic and subatomic physics. Quantum mechanical states as vectors in Hilbert Space. Dirac notation. Representation theory. Perturbation theory. A limited number of applications to physical phenomena will be considered. Prerequisite: Ps 205. *Rec* 3, *Cr* 3. MR. BROWNSTEIN

230. Statistical Mechanics—Macroscopic properties of matter derived from a statistical consideration of microscopic properties of elementary systems. Relationships to thermodynamics and kinetic theory are examined. Prerequisite: Ps 162 or its equivalent, and mathematics through differential equations. *Rec* 3, *Cr* 3. MR. HARMON

234. X-Rays—Diffraction theory applied to structure determinations of solids, liquids, and gases. Not offered every year. *Rec* 3, *Cr* 3. MR. BISCOE

291. Special Topics in Theoretical or Experimental Physics—Subjects which may be studied under this heading depend upon current interests of students and staff. Will ordinarily be in areas for which no formal courses are offered. Given on demand. *Cr Ar.* STAFF

300. Graduate Seminar—Reports and discussion of recent developments in physics and related fields based on the literature or the results of current investigations. *Cr Ar.*

307. Nuclear Physics—Specialized application to the atomic nucleus of the principles of modern physics as developed in Ps 205, which is prerequisite. Not offered every year. *Rec* 3, *Cr* 3. MR. HESS

313. Electrodynamics II—Propagation of electromagnetic waves as observed in both fixed and moving frames of reference. Scattering of electromagnetic waves including diffraction theory. Electromagnetic field fluctuations and coherence theory. Prerequisite: Ps 212. Not offered every year. *Rec* 3, *Cr* 3. MR. KRUEGER

315. Spectroscopy at Microwave and Radio Frequencies—Interpretation

of spectra at microwave and radio frequencies. Techniques associated with nuclear magnetic resonance and electron spin resonance are considered. Prerequisite: Ps 205, Ps 192, or equivalent. *Rec* 3, *Cr* 3. MR. CARR

321. Quantum Mechanics II—Scattering, phase shifts. Relativistic wave equations, consequences of the Dirac equation. Systems of coupled fields. Prerequisite: Ps 220. MR. BROWNSTEIN

324. Solid State Physics I—Application of the principles of modern physics to the study of the solid state of matter. Theoretical concepts are correlated with experimental evidence in the physical reasoning which underlies the interpretation of the physical properties of solids. Prerequisite: Ps 205. *Rec* 3, *Cr* 3. MR. CAMP

325. Solid State Physics II—An extension of Ps 324 to include such topics as lattice waves, electron states, electron-electron interaction, transport properties, magnetism and superconductivity. Prerequisite: Ps 324 or equivalent. *Rec* 3, *Cr* 3. MR. CAMP

328. Plasma Physics—Gas kinetic theory extended to systems of charged particles; development of macroscopic theory from the Liouville equation; macroscopic properties of plasmas, including a consideration of plasma oscillations and interactions with electromagnetic radiation. Prerequisite: Ps 212 and Ps 230 or equivalent. *Rec* 3, *Cr* 3. MR. HARMON

399. Graduate Thesis—*Cr Ar.* GRADUATE STAFF

GRADUATE WORK IN PHYSICS

The degrees of master of science and doctor of philosophy are offered in physics. See section on Graduate Study for detailed requirements.

SPECIMEN CURRICULUM IN PHYSICS[1]

Freshman Year

FALL SEMESTER			Hours	SPRING SEMESTER			Hours
Ps	1	or 1a General Physics	4	Ps	2,	or 2a General Physics	4
Ms	12	Anal. Geometry and Calculus	4	Ms	27	Anal. Geometry and Calculus	4
Eh	1	Freshman Composition	3	Eh	10	Modern Literature	3
		Foreign Language	3			Foreign Language	3
Pe	1	Physical Education	0	Pe	2	Physical Education	0
			14				14

Sophomore Year

			Hours				Hours
Ps	17	Intermediate Physics	4	Ps	18	Intermediate Physics	4
Ps	36	Introd. Mod. Physics	3	Ps	172	Optics	3
Ms	28	Calculus	4	Ms	29	Differential Equations	4
Ge	7	Computer Programming	2			Foreign Language	3
		Foreign Language	3	Sh	1	Fund. Pub. Speaking	3
			16				17

Junior Year

			Hours				Hours
Ch	13	Chemical Principles	4	Ch	14	Chemical Principles	4
Ps	153	Electrical Measurements	3	Ps	169	Atomic Physics	3
Ps	155	Electricity and Magnetism	2	Ps	176	Physical Measurements	2
Ms	153	Part. Diff. Equations	3	Ms	154	Part. Diff. Equations	3
		Humanity or Social Science	3			Humanity or Social Science	3
			15				15

Senior Year

	Hours		Hours
Electives[2]	9	Electives[2]	9
Social Science or Humanity	3	Social Science or Humanity	3
Social Science	3	Social Science	3
	15		15

1. This curriculum is intended to be suggestive of a typical program. Modifications are possible.
2. One physics course should be included.

POLITICAL SCIENCE (Pol)

PROFESSORS MAWHINNEY, SCHOENBERGER AND THOMSON; ASSOCIATE PROFESSORS CLARK, COLLINS AND PALMER; ASSISTANT PROFESSORS CARSTARPHEN, HAYES, HENDERSON, HORAN, REID, SHIN, AND WIKSTROM; INSTRUCTOR HELMKE; MR. BAGGETT, MR. MARSTERS, MR. HAAG, MRS. GODWIN, MR. DIXON, MR. MCCONAHA, MR. MOORE, MR. REDINGTON

Students may major in the following fields: (1) political science, (2) international affairs, or (3) public management.

Specific requirements for majors:

1. Political Science: A minimum of 36 hours of work in the department excluding Pol 7.8 and Pol 21.22 Required courses: Pol 1/2, Pol 183/184 or 189.190, and for all seniors Pol 197. In addition a student is required to select one of the following alternatives. (1) Related Areas—General: Any three of the following full-year courses: Ay 1/2, Ec 1/2, Hy 3.4 or 5.6, Pl 1.2, Py 1/2, or Sy 3/4; or (2) Related Areas—Specific: 18 hours, including a six-hour foundation course, in one of the following fields: economics, history, psychology, or sociology and anthropology.
2. International Affairs: See page 114.
3. Public Management: See page 71.

The department offers M.A. degrees in political science and public management and a master of public administration degree. Students desiring to concentrate in international affairs may do so within the M.A. in political science.

Bureau of Public Administration

Created within the Department of Political Science by the 102nd Maine Legislature, the Bureau of Public Administration is engaged in governmental research and publication and in programs of career development over the state.

Political science students are encouraged to use its collections of governmental materials.

Courses in Geography (Ge)

1. Physical Geography—Basic knowledge of the world's physical environments, organized under five topics; maps, weather and climate, landforms, soils, and vegetation. Prerequisite: sophomore standing. *Cr* 3.

2. World Regional Geography—A study of world regions and their human occupants. Special attention will be given to those regions which are the focus of world attention. Prerequisite: sophomore standing. *Cr* 3.

26. Economic Geography—The geographical aspects of world resources, production, and trade. Prerequisite: sophomore standing. *Cr* 3.

101. Historical Geography of North America—The growth of the American economy studied in its spatial aspect as reflected by urban and rural settlement patterns. Particular attention given to three historical "cross-sections": 1760, 1860, and 1910. Prerequisite: junior standing. *Cr* 3.

102. Urban Geography—Techniques of regional geographic analysis as applicable to urban study. Emphasis on spatial patterns which transport facilities and associated commercial, residential, and governmental land uses assume in the American city. Prerequisite: junior standing: *Cr* 3.

123/124. Political Geography—The geographic and demographic factors that condition national and international politics. Emphasis will be placed on the relationships of the major nations to their areas and to the world, on examination of the strategic necessities, and on historical reviews of their resultant foreign policies. *Cr* 3. MR. SCHOENBERGER

Courses in Political Science (Pol)

1/2. Introduction to Government—An introduction to the discipline of political science, with emphasis on United States government and politics. Political systems, cultures, and ideologies are discussed; political institutions and processes in the United States are studied and compared with those of other Western and non-Western states. *Cr* 3. MR. HORAN, CHAIRMAN

3. State Government—State constitutions, structure and functions of state government, relations with federal, state and local governments. Prerequisite: sophomore standing. *Cr* 3. MR. PALMER

7. 8. Maine Government—Practical operations and current problems of state and local government in Maine. One lecture each week by an official, followed by a discussion period. Open to all students. *Cr* 1.

MR. WIKSTROM AND GUEST LECTURERS

7a. 8a. Maine Government—Designed for prospective teachers and others who wish more material on Maine government than is given in Pol 7.8. No person may receive credit for both Pol 7 and 7a or for both Pol 8 and 8a. *Cr* 2.

21. 22. Current World Problems—A study of contemporary national and international affairs based on area studies of the United States, the Soviet Union, Europe, the Middle East, the Far East, and Southeast Asia. Open to all students. *Cr* 2. MR. SCHOENBERGER

55. Congressional Internship—A first-hand study of the national legislative process and the function of the legislator. The student will be assigned to

the staff of a Congressman or Senator in Washington, D.C., from about February 1 to the end of June. Readings and reports are required in addition to the staff work. Open to juniors on a competitive basis. Rules announced publicly each fall semester. *Cr* 6.

131. Introduction to Comparative Politics—A systematic study of the nature, dimensions, and issues in the discipline of comparative politics. The course will emphasize relevant theories and approaches, basic conceptual tools, analytical skills, spatial and chronological surveys of various political systems, and the processes of political development. Prerequisite: Pol 1/2. MR. HENDERSON

133. The American City—The process of government in urban America, including concepts of local self-government, forms and procedures in urban governing, and developments in intergovernmental relations and metropolitan areas. Prerequisite: Pol 1/2. *Cr* 3. MR. WIKSTROM

134. Municipal Administration—The management, financial control and administration of modern American cities; emphasis on personnel and finance administration, the city plan, and line functions: public safety, transportation, health and welfare, housing. Prerequisite: Pol 133. *Cr* 3. MR. WIKSTROM

135. Democratic Governments of Europe—The political traditions, parties, governmental structures, and special political problems of Great Britain, France and West Germany. Prerequisite: Pol 1/2. *Cr* 3. MR. HORAN

136. Communist Governments—Marxism-Leninism and the contemporary Communist party, state, economy and society of the Soviet Union. Survey of the satellites. Prerequisite: Pol 1/2. *Cr* 3. MR. HORAN

144. Public Relations—Principles of public relations and a study of their application through cases and problems. National, international, community and educational public relations with press, consumers, taxpayers, and other groups. *Cr* 2.

151. Public Administration—The dynamics of governmental administration including administrative principles, decision-making, communication, leadership organizational models and technical, political and personal factors of administration. Prerequisite: Pol 1/2. *Cr* 3. MISS CARSTARPHEN

152. Administrative Law—Primarily case studies of the legal adjustment of administrative authority and individual liberty, including: judicial control over administration, personal liability of officers, scope and limits of administrative powers and the due process measurement of administrative procedure. Prerequisite: Pol 151. *Cr* 3. MISS CARSTARPHEN

156. Political Parties—Development and present organization and operation of the American party system. Nature and function of major and minor parties, sectionalism, nominating systems, presidential and congressional elections, the electorate, finance, interest groups. Prerequisite: Pol 1/2. *Cr* 3. MR. HAYES

158. Public Opinion—The role of public opinion in American democracy; definition and measurement; sociological and psychological influences; mass media; linkage to government. Prerequisite: Pol 1/2. *Cr* 3. MR. HAYES

159. Problems of American Government—An examination of basic problems of American national government. Case studies in such areas as federalism, the nature of the presidency, congressional organization, civil rights and liberties, the role of the judiciary, and foreign affairs. Prerequisite: Pol 1/2. *Cr* 3.
MISS CARSTARPHEN

160. Problems of State Government—An examination of basic problems of

American state government. Case studies in such areas as the role of the states in the federal system, the office of the governor, lawmaking, administrative organization, the nature of the judiciary, and the future of state government. Prerequisite: Pol 1/2. *Cr* 3. MR. WIKSTROM

165. Governments of South Asia—The governments and politics of selected countries of South and Southeast Asia. Emphasis on common problems of emergent nations of the area. *Cr* 3. MR. HENDERSON

166. Governments of East Asia—A study of the contemporary political systems of China and Japan. *Cr* 3. MR. HENDERSON

167. Emerging Africa—The transition of Ghana, the Congo and other selected areas from colonial to independent states. Attention to political and economic organization and the native culture's impact on government. Prerequisite: Pol 1/2. *Cr* 3. MR. THOMSON

168. Government in Latin America—Concentration on "political styles," the contemporary struggle between tradition and revolution, political elites, economic and political problems. Selected case studies, not necessarily the same each year. Prerequisite: Pol 1/2. *Cr* 3. MR. HENDERSON

173. 174. International Relations—In the first semester an analysis of the international system of states; the impact of nationalism; the restraints imposed on the unilateral actions of governments; and the possibility of peace resulting from war, disarmament, functionalism, and diplomacy. In the second semester a comparative analysis of the recent foreign policies of the major governments of the world. Prerequisite: Pol 1/2 or six hours of history. *Cr* 3.

MR. SCHOENBERGER AND MR. HORAN

182. Introduction to Law—The focus of the course is on the nature and functions of law in the modern world; on law as part of the study of society. Not a technical course in law. Prerequisite: junior or senior standing. *Cr* 3.

MR. THOMSON

183/184. Constitutional Law—The economic, political and social development of the Constitution through Supreme Court decisions. Court procedures. First semester: decisions on the nature of the federal system and commerce, taxation and war powers. Second semester: decisions in civil liberties; Bill of Rights and Fourteenth Amendment. Prerequisite: Pol 1/2. *Cr* 3. MR. MAWHINNEY

187. International Law—Historical treatment and analysis. Includes development of international law, recognition of states, nationality, law of treaties, responsibilities of states, and legal regulation of the use of force. *Cr* 3.

MR. COLLINS

188. International Organization—The forms, functions and development of international organization. Conferences, international administration and adjudication, international federation, world government. United Nations and specialized agencies—organization and administrative procedures. *Cr* 3.

MR. COLLINS

189. 190. Political and Social Thought—A survey of political theories from ancient Greece to the French Revolution. The basic approach is historical, and seeks to relate theories of politics to the environments in which they developed. Prerequisite: junior or senior standing. *Cr* 3. MR. REID

191. American Political Ideas—The development of political ideas in America from 1620 to the present. *Cr* 3. MR. THOMSON

192. Modern Political and Social Thought—From the French Revolution to the present. Liberalism, utilitarianism, socialism, fascism, communism. *Cr* 3. MR. THOMSON

194. Asian Political Ideas—The traditional pattern of Asian thought on man, society and politics: Chinese, Indian (Hindu), Muslim. Seminar style, one two-hour meeting per week. Prerequisite: junior standing. *Cr* 3.

195. Municipal or State Internship—Professional experience in either a local government unit or a department or agency of state government. Open to selected students. Reports and readings required. State government option available under the Maine State Government Internship Program enacted by the 103rd Legislature; Municipal Government option required for the B.A. or M.A. degree in Public Management. *Cr* 3. or 6 hrs. Students may not receive more than 6 credit hours for internships within the department.

196. International Affairs Internship—Study during the summer in a government agency, an international organization, or a business with overseas operations. Readings, reports, and on-the-job training required. Open to junior or senior International Affairs majors. *Cr* 3. MR. SCHOENBERGER

197. Scope of Political Science—The scope and nature of the study of politics: power and society; basic descriptive political theory and the role of political institutions. Prerequisite: Pol 1/2. Open to senior Political Science majors or with permission. *Cr* 3. MR. HAYES

198. Methods of Political Science—Present methodological techniques in empirical political research, including analysis of empirical theory, voter surveys, sampling procedures, questionnaire construction, hypothesis testing, statisitcal quantification, computer applications, and research evaluation. Prerequisite: Pol 197. Open to senior Political Science majors or with permission. *Cr* 3. MR. HAYES

199. Theory and Methodology of International Relations—An analysis of traditional and current theories of international politics and the application of such theories to specific situations. Particular emphasis will be given to such approaches as systems analysis, game theory, decision-making, simulation, and the development of theoretical models. Prerequisite: Pol 173, *Cr* 3. MR. SCHOENBERGER

200. City and Regional Planning—Basic principles of city and regional planning; legislative aspects and court decisions; administrative organization and application; zoning; land use; financing; formulation of master plans, and their administration; political problems and public relations. Prerequisite: Pol 133 or permission. *Cr* 3. MR. WIKSTROM

201. State Administration—An analysis of the principles of organization of the executive branch of state government. Selected problems of function, structure, and area will be considered, with reference to such state functions as finance, education, health and welfare, regulation of economic enterprise, and planning. An examination of the role of administration in policy formation, together with its interaction with the formal and informal political institutions of state government. Prerequisite: Pol 151. *Cr* 3. MR. PALMER

212. Electronic Data Processing in Public Administration—Analysis of the historical development, present applications, and future uses of data processing in public administration at federal, state and local levels of government. Particular emphasis is placed on the applicability of data processing to personnel and financial administration and to decision-making in public administration through simulation and computer model-building. Prerequisite: Pol 151. *Cr* 3.

217. Comparative Administrative Systems—A comparative study of public administration in the nation-states contrasting selected developed and developing nations. Concepts of various administrative systems, political system ecologies and models will be utilized as perspectives for comparing bureaucracies. Prerequisite: Pol 151. *Cr* 3. MR. SHIN

273. Problems in International Politics—Analysis of the relationships among various national foreign policies as they are pursued in the international system. Emphasis will be placed in different semesters on problems of diplomacy, war, alliances, arms limitation, and national power. *Cr* 3. MR. SCHOENBERGER

283. 284. American Constitutional Development—A chronological and topical study of the American constitutional system from its colonial origins to the present civil rights era. The course examines the evolution of executive, legislative and judicial power relationships and analyzes persistent concepts and problems of constitutionalism. Students are expected to investigate topics of constitutional significance. *Cr* 3. MR. THOMSON

287. Problems in International Law—An in-depth analysis of selected problems in international law, emphasizing the use and evaluation of primary international law materials. Each student will single out a particular topic for exploration. Illustrative of the types of topics to be considered are: the law of the sea, space law, resort to force, international protection of foreign investments, and the attitude of newly independent states toward international law. *Cr* 3.
MR. COLLINS

297. 298. Seminar—Projects for qualified students. *Cr* 2 or 3.

302. Topics in Public Administration—*Cr Ar.*

303. Topics in International Relations—*Cr Ar.*

310. Administrative Theory—Emphasis on empirical theories of informal and formal organization and behavior: organization theories; concepts of authority; compliance systems; communications structures; models of decision-making; small group behavior; and modes of individual accommodation to organization. Prerequisite: Pol 151. *Cr* 3. MR. SHIN

311. Program Analysis and Evaluation—Considers definition of social conditions, determination of program goals, allocation of resources in terms of their contributions to goal attainment, selection of efficiency measures, formulation of strategies. Prerequisite: Pol 151. *Cr* 3.

320. Urban Regional Government—An examination of the governmental patterns in major American urban areas. Selected metropolitan problems, including intergovernmental relations, impact of federal programs, regional planning, and the administration of services, will be analyzed. Consideration will be given to theories regarding power structure and decision-making apparatus. *Cr* 3.
MR. WIKSTROM

325. Planning and Organization for Economic and Social Development—This course is a study of the limitations, procedures, and problems associated with achieving purposeful, economic and social development. The investigation draws from the experience of both high and low income economies and from both national and sub-national levels of government. The instruments and problems of implementation are examined and attention is given to sectoral planning and implementation in industry, agriculture, education and manpower as well as in public development corporations. Open only to Public Administration students or by permission of instructor. *Cr* 3.

327. Intergovernmental Relations—A study of the administrative aspects of federalism in the U.S. including federal-state, federal-local, interstate and inter-local cooperative mechanisms. Emphasis will be placed upon a systems approach to the administrative mechanisms useful to achieve a maximum benefit in the allocation of scarce resources. *Cr* 3.

331. Seminar in Comparative Politics—A critical and detailed inquiry into the nature of several salient features of the political universe, such as dissensus, violence, techniques of political mobilization, manipulation of symbols, and tension management, and their relationships to the perennial issues of stability and progress. *Cr* 3. MR. HENDERSON

333. Community Political Power Structures—An examination of the location of political power in the American community; operational concepts and general methodological approaches defined; empirical findings based on various methodological approaches employed; conclusions on community political systems and power. *Cr* 3. MR. WIKSTROM

350. Independent Readings—*Cr Ar.*

397. Method Seminar in Public Administration—Consideration of the state of current research on the scope and methods of public administration. Particular emphasis is placed on theories of empirical analysis, quantifications of data, presentation of findings, and bibliographical methods. Open only to Master of Public Administration students. *Cr* 3.

398. Project Seminar in Public Administration—A seminar for qualified students in Public Administration in which students will demonstrate proficiency in the use of research methods and public administration concepts. For those students without practical administrative experience, upon approval, an administrative internship may be substituted for a research project. Prerequisite: Pol 397 or permission of instructor. *Cr* 3.

399. Graduate Thesis.

PSYCHOLOGY (Py)

PROFESSORS PLISKOFF (CHAIRMAN), ANTONITIS, BRUSH, GLANVILLE, NICHOLS, SAPER; ASSOCIATE PROFESSORS ABELSON, HAMMER, G. KULBERG, MAGARO, STONE, WADE; ASSISTANT PROFESSORS CHERULNIK, FARTHING, GERSHMAN, GOLD, J. KULBERG, RYCKMAN; LECTURERS GRANT, SANDERS

The instruction offered by the Department of Psychology is designed to acquaint the student with psychology as a biological science and as a social science. The department provides the student with training in psychological theory and methodology as well as in the applications of psychology.

The minimum requirement for a major in the department is 36 hours, which must include Py 1/2, Py 141, Py 171, and Py 74. In addition each major is required to take at least one course from each of the following areas:

I. Py 45 or Py 147/148
II. Py 151, 155, 156, 157, 161, 165, 167
III. Py 130, 132, 133, 138
IV. Py 20, 21, 123, 124, 126, 127, 128
V. Py 111, 114, 117, 143

A limited number of women majors interested in family life and child development may arrange to spend one semester at the Merrill-Palmer School in Detroit, Michigan, in the junior year.

Py 1/2, General Psychology, is a prerequisite for all advanced courses in the department.

1/2. General Psychology—Survey of psychology as the science of behavior. Lecture and discussion of major areas such as motivation, personality, intelligence, learning, etc. In order to provide greater depth to the course, all students are expected to participate in research projects to a maximum of two hours. *Cr* 3. STAFF

5. Applied Psychology for Nurses—An introductory course for three-year nurses. *Cr* 2. MR. BRUSH

Unless other prerequisites are stated, Course 1/2 or the equivalent is prerequisite for the following advanced courses.

20. 21. Child Study Laboratory—Observation and study of a group of pre-school children. Individual projects, supplemented by reading and class discussions. Opportunity to assist in guiding the children's activities. *Rec* 2, *Lab* 3, *Cr* 3. MR. NICHOLS, MRS. GERSHMAN

45. Principles of Experimental Psychology—General principles, methods and techniques of experimental psychology. Applications of general methodology and specific techniques to major problem areas in behavioral research. Laboratory exercises provide experience in collecting and reporting data. Prerequisite: Py 141. *Rec* 2, *Lab* 2, *Cr* 3. MR. WADE

90. Problems in Psychology—Opportunity to carry out a particular research problem under supervision. *Per. Cr. Arr.*

74. Seminar in Issues in Contemporary Psychology—A review of some of the current theoretical issues and research findings in the general areas of psychology. *Cr* 3. MR. MAGARO

103. Applications of Behavior Principles—Methods employed in the experimental analysis of behavior; principles of respondent (classical) and operant (instrumental) conditioning; applications of principles to the understanding and control of behavior in everyday life situations. *Cr* 3. MR. ANTONITIS

111. Business and Industrial Psychology—Applications of psychological principles, facts, and research methods to problems of trait and proficiency measurement, selection, efficiency, training, accidents, motivation, and adjustment in business and industry. *Cr* 3. MR. BRUSH

114. Aptitude Testing—The use and interpretation of psychological tests and related techniques in vocational guidance and vocational selection. Occupational description and classification. Applications in such fields as business, industry, education, and public agencies. *Rec* 2, *Lab* 2, *Cr* 3.

117. Educational Psychology—The underlying psychological principles useful to the educator: understanding individual differences in development, personality, intelligence; principles of effective learning; interpretation of standardized tests. *Cr* 3. MRS. KULBERG

118. Learning and Programmed Instruction—Application of the principles of learning to programmed instruction. Specific topics considered will also include various kinds of teaching machines, the learner's role, programming process, and educational implications. *Cr* 3. MR. GOLD

123. Psychology of Childhood—A systematic study of the child's behavior

and psychological development. Emphasis upon principles underlying development, methods of child study, and practical implications. *Cr* 3. MRS. GERSHMAN

124. Psychology of Adolescence—Adolescent development in the physical, intellectual, emotional, and social spheres. Adolescent personality and problems of adjustment in relation to the family, the school, and the community, and the world of work. Delinquency and abnormality in adolescents. *Cr* 3. MRS. GERSHMAN

126. Psychology of the Retarded Child—Description and analysis of various types and levels of retardation and study of causative factors. Consideration of psychological principles and techniques applicable to the identification, care, and training of retarded children. Prerequisite: Py 123. *Cr* 3. MR. NICHOLS

127. Psychology of the Superior Child—Identification, development, and behavioral characteristics of superior children. Discussion of social and psychological problems associated with the superior child. *Cr* 3. MRS. GERSHMAN

128. Psychology of the Exceptional Child—A consideration of the development and behavior of the exceptional child. Special emphasis on the practical problems related to the management of children with intellectual, emotional, orthopedic, sensory, and academic handicaps. Prerequisite: Py 123. *Cr* 3.

MR. NICHOLS

130. Social Psychology—The psychological principles which enter into the social behavior of man. Representative topics include culture and personality, crowd behavior, prejudice, and propaganda. *Cr* 3. MR. RYCKMAN, MR. STONE

132. Mental Hygiene—A consideration of the fundamental factors in human adjustment with emphasis upon the prevention of inadequate adjustments and upon the processes by which maladjusted individuals may be restored to normal living. Family and educational situations will be emphasized. *Cr* 3. MR. HAMMER

133. Abnormal Psychology—The origin, development, and manifestations of the psychoneuroses and major psychoses with a view to better understanding of adjustment. Emphasis of the biological, social, and psychological determinants of maladjusted behavior. Prerequisite: Py 1/2 with grade C or better. *Cr* 3.

MR. KULBERG, MR. MAGARO

138. Theories of Personality—A survey of the chief contemporary approaches to the study of personality. Critical issues in personality. Consideration of assessment techniques and research methods. Prerequisite: Py 1/2 with grade of C or better. *Cr* 3. MR. BRUSH

141. Statistics in Psychology—A survey of techniques used to obtain, display, analyze, and interpret data in psychology. *Cr* 3. MR. ABELSON, MR. GOLD

147. 148. Experimental Psychology—*First semester:* Techniques and objective approach to the study of human perception, learning, psychophysics, etc. Training in writing psychological research reports. *Second semester:* Basic principles in programming and use of operant conditioning procedures with animal subjects. Planning and conducting an original investigation by the student. *Rec* 2, *Lab* 4, *Cr* 4. Prerequisite or concurrently: Py 141 MR. GLANVILLE

151. Psychology of Motivation—A survey of theory, research methodology and experimentally obtained facts related to the activation and direction of behavior. *Cr* 3. MR. GOLD, MR. PLISKOFF

155. Psychology of Learning—Basic principles that underlie the discovery, fixation, and retention of new modes of human behavior. Conditioned response learning, serial learning, memory and forgetting, transfer of training, thinking and

problem solving, insight and concept formation, individual differences in learning. *Cr* 3. MR. FARTHING, MR. PLISKOFF, MR. WADE

156. Theories of Learning—An examination of the most important current psychological theories concerning the nature of the learning process including the behavioristic positions (Guthrie, Skinner, the Hullian group, Estes), Gestalt positions (Lewin, Tolman), and dynamic psychology (psychoanalysis). Applications of the theories will be made. *Cr* 3. MR. ANTONITIS, MR. PLISKOFF

157. Learning in the Classroom—An examination of the basic phenomena and principles involved in understanding and managing the learning process in the classroom from subprimary through the college level. Prerequisite: Py 117 or equivalent. *Cr* 3. MRS. KULBERG

161. Sensation and Perception—A systematic examination of selected sensory and perceptual processes. Emphasis on the experimental method, research findings and theoretical interpretations. *Cr* 3. MR. GLANVILLE

165. Physiological Psychology—Physiological bases of behavior with emphasis upon the development and function of the nervous system and the sense organs; the relation between psychological processes and physiological activity. Prerequisite: a basic course in Zoology. *Cr* 3. MR. ABELSON

167. Animal Behavior — An examination of the behaviors exhibited by animals in natural and laboratory environments including learning, social behavior, communication, navigation, etc. Various methods of investigating and classifying animal behavior are critically evaluated. *Cr* 3.

171. History and Systems of Psychology—An historical account of the development of psychology; the development of psychological concepts and points of view prior to Wundt; a consideration of the major modern systems and schools of psychology. *Cr* 3. MR. GLANVILLE, MR. PLISKOFF

222. Advanced Child Psychology—Intensive reading and evaluation of recent research literature in child psychology. Emphasis on special areas related to the normal, retarded, and emotionally handicapped child. Prerequisite: consent of instructor. *Cr* 3. MR. NICHOLS

223. Identification of Emotionally Disturbed Children — An advanced course designed to include the identification and diagnosis of emotional disturbance in school age children. Such areas as incidence, depth, and emotional disturbance will be covered from an educational viewpoint. Extensive reading and some field work will be associated with the course content. Prerequisite: permission of the instructor. *Cr* 3. MR. SAUNDERS

224. Experimental Child Psychology—Major research methods, principles, and techniques in the experimental study of child behavior; closely supervised research experiences with children. The student will plan and conduct an original investigation. Prerequisite: Py 123, Py 147/148 or equivalent. *Rec* 2, *Lab* 4, *Cr* 4. MR. NICHOLS

234. Advanced Psychopathology — Intensive readings and discussion of etiology and maladapted behavior with particular emphasis on topics such as schizophrenia, neuroses, sociopathy, etc. Prerequisite: Py 133 and consent of instructor. *Cr* 3. MR. KULBERG

242. Psychological Methodology—An intermediate level survey of the various methods and techniques employed by psychologists in the evaluation of data and the verification of hypotheses. Prerequisite: Py 45 or Py 147 and Py 141. *Cr* 3. MR. WADE

243. Correlation Techniques—An intermediate level survey of the various methods and techniques employed by psychologists for determining extent of covariation in sets of measurements; survey of prediction methods. Prerequisite: Py 141 or equivalent. *Cr* 3. MR. GOLD

244. Psychological Test Theory—The fundamental theoretical bases of test construction with emphasis on practical applications will be presented along with statistical concepts necessary for proper evaluation of tests and other assessment techniques. Prerequisite: Py 141 or equivalent, consent of instructor.

245. Nonparametric Techniques in Psychology—A survey of nonparametric techniques of hypothesis testing which are uniquely suited to the data of the behavioral sciences. Prerequisite: Py 141 or consent of instructor. *Cr* 2.

247. Introduction to Factor Analysis — Multivariate techniques used in psychology with special emphasis on factor analysis and techniques of application to a variety of problems. Prerequisite: Py 243 or consent of instructor. *Cr* 3.

251. Advanced Physiological Psychology—Emphasis on development of laboratory skills and techniques; preparing students for independent research in physiological psychology. Supervised research in electrophysiological stimulation, cannulization techniques, and special behavioral response measurements. Prerequisite: Py 165. *Rec* 1, *Lab* 5, *Cr* 4. MR. ABELSON

261. Advanced Social Psychology—A consideration of current theoretical and methodological issues in social psychology including interpersonal perception, attitude and attitude change, communication and persuasion, language and cognition. *Cr* 3. MR. RYCKMAN, MR. STONE

265. Attitudes and Opinions—The nature, development, and measurement of social attitudes. Applications to the understanding of prejudice, intergroup conflict, political and religious behavior. Prerequisite: Ms 19 or equivalent; Sy 3/4 or Py 130. *Cr* 3. MR. STONE

303. Ethics and Professional Problems—Discussion of common professional problems encountered in the practice of psychology; consideration of responsibilities and limitations of the psychologists in the light of the ethics recommended by the American Psychological Association. *Cr* 1. MR. GRANT

311. Scientific Inquiry in Psychology—A discussion of the philosophy and history of scientific inquiry as it pertains to psychological research; issues related to the scientific method with emphasis on data collection techniques; practice in the development and writing of research proposals. Prerequisite: Py 147/148 or its equivalent. *Cr* 3. STAFF

312. Advanced Experimental Psychology — Conduct of one or more original investigations of limited scope: analysis of results, report, and critique. Prerequisite: Py 311. *Rec* 1, *Lab* 4, *Cr* 3. MR. WADE

315. Advanced Experimental Design—Designed to provide graduate students with a sophisticated approach to the planning, conduct, and evaluation of research in psychology. Experimental designs will be considered that are unique to research in psychology. Prerequisite: Py 242. *Cr* 2. MR. WADE

317. Experimental Social Psychology — Experimental methods for the study of attitude change, small group behavior, social perception, conformity, socialization and conflict. Problems of design, control and measurement will be discussed in connection with laboratory projects. Prerequisite: Py 261 or permission. *Rec* 1, *Lab* 4, *Cr* 3. MR. STONE

321. Individual Psychological Testing—Intensive training in the adminis-

tration, scoring, and interpretation of the Revised Stanford-Binet Scale and the Wechsler Adult Intelligence Scale. Historical background and current problems in theory and practice of testing. Prerequisite: consent of the instructor. *Rec* 2, *Lab* 4, *Cr* 4.

325. Basic Methods in Assessment—Instruction in the basic theory, administration, scoring and interpretation of tests frequently used for psychological evaluation. This course will focus on individually administered tests of intelligence and personality. Prerequisite: Py 244 and consent of instructor. *Cr* 3. *Rec* 2, *Lab* 4.
MRS. KULBERG

326. Advanced Clinical Assessment — Methods for analyzing, integrating, and presenting material obtained in assessment will be discussed. The student will receive advanced training in the appropriate selection of tests, the interpretation and integration of test data, and report writing. Prerequisite: Py 325 and consent of instructor. *Rec* 3, *Lab* 4, *Cr* 3. MR. HAMMER

327. Clinical Interviewing—Principles, dynamics, and techniques of interviewing as applied to a variety of situations and settings. Prerequisite: consent of instructor. *Cr* 2. MR. KULBERG

328. Consultation—Principles and techniques of consultation. A consideration of the role of the psychologist consultant within a variety of settings including the school, social agency, industry, etc. Prerequisite: consent of instructor.

330. Practicum **(activity)**—Closely supervised experience in psychological evaluation, psychotherapy, behavior modification, consulting, research, teaching, or some combination of these in a field setting. Prerequisite: consent of instructor. *Cr Ar.* STAFF

341. Personality—An in depth survey of major personality theories from Freud to the present, including readings in original sources. A focus on normal development will be maintained. Prerequisite: consent of instructor. *Cr* 3.

342. Theories of Psychopathology—A study and evaluation of the theories developed to account for abnormal behavior. This will include analytic, neoanalytic, learning, phenomonological, and existential theories. Prerequisite: Py 133 and consent of instructor. *Cr* 3. MR. HAMMER

343. Seminar in Clinical Psychology—A critical review of current research literature in the area of clinical psychology including tests and measurements, psychotherapy, and personality theory. *Rec* 2, *Cr* 3. MR. KULBERG

347. Seminar in School Psychology—An examination of basic issues involved in the practice of school psychology. Attention will be given to historical and contemporary views of roles and functions; interrelationships with other school personnel, parents, and the community; professional preparation. *Cr* 3.
MRS. KULBERG

351. Child Psychopathology — Intensive readings and discussion of the development and dynamics of psychological disorders in children. Consideration will also be given to the implications for psychotherapy. Prerequisite: Py 341, Py 342. *Cr* 3.

355. Seminar in Psychotherapy—A study of the principles involved in behavior modification. These will be studied from both a theoretical and empirical point of view and will include readings of original research and theory. Prerequisite: Py 341, 342 and consent of instructor. *Cr* 3.

357. Case Studies in Psychotherapy—A critical review of actual psycho-

therapy recordings based on psychological theory, principles and techniques of psychotherapy. Prerequisite: Py 355 and consent of instructor. *Cr* 2.

MR. HAMMER

361. Seminar in History and Systems of Psychology—Intensive readings and consideration of the historical development of selected psychological concepts, theories and points of view; also critical discussion of selected systems of psychology. Prerequisite: Py 171 or its equivalent. *Cr* 3. MR. GLANVILLE

362. Seminar in Physiological Psychology—Current problems and theories of physiological psychology and the methods and techniques employed in studying them. *Rec* 2, *Cr* 3. MR. ABELSON

363. Seminar in Learning—An advanced consideration of significant topics in the area of learning. Reports and discussion of current research and theory. *Rec* 2, *Cr* 3. MR. FARTHING

364. Seminar in Motivation—A consideration of the phenomena and theoretical constructs subsumed under the concept of motivation. Presentation by the student of critical reports of current research. *Rec* 2, *Cr* 3. Prerequisite: consent of instructor. MR. GOLD, MR. PLISKOFF

365. Seminar in Perception—Advanced consideration of significant topics in the area of perception. Reports and discussion of current research and theories. *Rec* 2, *Cr* 3. MR. WADE

366. Seminar in Social Psychology—A consideration of significant topics in the area of social psychology. Reports and discussion of current research and theory. Prerequisite: Py 261 or consent of the instructor. *Cr* 3. MR. RYCKMAN

368. 369. Manpower Research Seminar—An examination of the economic, social, and psychological factors affecting manpower development and utilization. This interdisciplinary seminar is part of the University's manpower research project. It gives students a unique opportunity to participate in current research from problem formulation to data collection and analysis. *Cr* 3. Course same as Ba, Ec, Sy 368.369. By permission.

MR. CLARK, MR. FORSGREN, MR. STONE

371. Topics in Child Psychology—Intensive study of selected areas in child psychology. Prerequisite: consent of instructor. *Cr* 3.

372. Topics in Comparative Animal Behavior — Critical discussions of comparative and developmental aspects of animal behavior stressing phylogenetic and ontogenetic comparisons. Consideration of antecedent factors such as genetic, prenatal, and early postnatal experiences that may alter developmental processes. Prerequisite: consent of instructor. *Cr* 3.

373. Topics in Physiological Psychology—Examination of the neurological bases of behavior with emphasis on anatomical, neurological, and biochemical properties of the nervous system and behavioral correlates in man and animals. Prerequisite: Py 165 or consent of instructor. *Cr* 3.

374. Topics in Learning — Intensive examination of selected models of learning emphasizing their roles as laboratory vehicles for investigating behavior. Methodological implications will be considered within a framework of classical, instrumental, and statistical research orientations. Prerequisite: Py 155 or consent of instructor. *Cr* 3.

375. Topics in Sensation and Perception—Consideration of current experimental literature in selected areas of sensation and/or perception; critical examination of the newer theoretical issues; discussion and evaluation of theoreti-

cal interpretations of sensory and perceptual phenomena. Prerequisite: Py 161 or consent of instructor. *Cr* 3.

376. Topics in Quantitative Methods in Psychology—Intensive study of selected areas dealing with experimental design and measurement in psychology. Prerequisite: consent of instructor. *Cr* 3.

377. Topics in Clinical Psychology—A critical, intensive study of specific topics in clinical psychology. Prerequisite: consent of instructor. *Cr* 3.

390. Directed Research: (area)—Opportunity to select and research a particular problem in psychology under faculty direction. Prerequisite: consent of instructor. *Cr* not to exceed 6. STAFF

392. Directed Reading: (area)—Opportunity to read in a particular area of psychology under faculty direction. Prerequisite: consent of instructor. *Cr* not to exceed 6. STAFF

399. Graduate Thesis—*Cr Ar.* STAFF

Courses Offered Periodically

136. Psychodrama I—*Cr* 3.

137. Psychodrama II—*Cr* 3.

GRADUATE WORK IN PSYCHOLOGY

The department offers work leading to the master of arts degree and the doctor of philosophy degree, the general requirements for which are listed in the catalog of the graduate school. Candidates will be expected to have taken fundamental courses in psychology, including a laboratory course in experimental psychology and a basic course in statistics.

Graduate programs are offered in general-experimental psychology and in clinical psychology. Those interested in the general-experimental area may emphasize learning, and motivation, physiological psychology, social psychology, or child behavior. The program in clinical psychology provides students with a broad background in theory, psychopathology, assessment, and psychotherapy through courses, seminars, and practicum experiences. Those who are enrolled in work leading to the doctorate in clinical psychology must also satisfactorily complete a one-year internship in a training center acceptable to their program committee. An acceptable thesis is required for both the M.A. and Ph.D. degrees.

SOCIOLOGY (Sy)

PROFESSOR SEZAK; ASSISTANT PROFESSORS BOLARIA, DEWITT, MANEKER, NOLAN, SALEEBEY, SCIMECCA, STEIN AND TENNANT; COOPERATING MEMBERS: PROFESSOR PLOCH; ASSISTANT PROFESSOR HYATT*; INSTRUCTOR GAMACHE; GRADUATE ASSISTANTS MOHAN, NYBERG, STONE.

The Department of Sociology presents a program of study designed to further the student's perception and understanding of social interaction and group pro-

* Sabbatical, 1969-70

cesses, and to provide fundamental concepts and basic research skills in the disciplines for which the department is responsible—sociology and social welfare.

The undergraduate major in the department may select and develop, in consultation with his adviser, a basic curriculum (or a series of courses) which will give him an opportunity to develop his interests and provide him with the background necessary for his future needs.

Students in the department major in sociology, which includes those who concentrate in (a) sociology or (b) social welfare. All students must meet the general requirements of the College of Arts and Sciences, and one of the following:

Specific Requirements for Sociology Majors:

Sociology Option: Introduction to Anthropology (Ay 1/2), Introduction to Sociology (Sy 3/4), Statistical Methods for Sociological Research (Sy 119), Methods of Social Research (Sy 120) and Sociological Theory (Sy 160).

Non-departmental electives recommended are General Psychology (Py 1/2), Social Psychology (Py 130), Principles of Economics (Ec 1/2), and Introduction to Government (Pol 1/2).

Social Welfare Option: Introduction to Anthropology (Ay 1/2), Introduction to Sociology (Sy 3/4), Statistical Methods for Sociological Research (Sy 119), Sociological Theory (Sy 160), Social Welfare (Sw 150/151) and Social Work as a Profession (Sw 152/153). In addition, Field Experience in Social Welfare (Sw 154/155) is available as an elective. These required Sw courses meet the current recommendations of the Council on Social Work Education, of which this department is a constituent member.

The two introductory courses, Ay 1/2 and Sy 3/4, should be taken during the freshman or the sophomore year. The Introductory Anthropology and Sociology courses may be taken concurrently. A minimum of 36 hours of departmental course work must be taken; the maximum number of hours permitted within the department is 48.

Students who wish to explore the requirements for graduate study or the professional or career aspects of the disciplines (sociology, social welfare) should consult with their departmental adviser.

Sociology of Education (Sy 5ed), Sociology for Nurses (Sy 6n), and Marriage (Sy 7) do not carry credit toward the department major.

A specimen curriculum for the freshman-sophomore years is provided in the appropriate College of Arts and Sciences section of this catalog.

The department offers a program of study leading to the master of arts degree in sociology. The general requirements are described in the Graduate School Catalog.

SPECIMEN CURRICULUM IN SOCIOLOGY

The sociology major is required to take Introduction to Anthropology (Ay 1/2), Introduction to Sociology (Sy 3/4), Statistical Methods Sociological Theory (Sy 160). The sociology major who elects the Social Welfare option is required to take Introduction to Anthropology (Ay 1/2), Introduction to Sociology (Sy 3/4), Statistical Methods for Sociological Research (Sy 119), Sociological Theory (Sy 160), Social Welfare (Sw 150/151) and Social Work as a Profession (Sw 152/153).

Freshman Year

Ay	1	Introduction to Anthropology	Ay	2	Introduction to Anthropology
Sy	3	Introduction to Sociology	Sy	4	Introduction to Sociology
Eh	1	Freshman Composition or Eh 9, Modern Literature	Eh	1	Freshman Composition or Eh 10, Modern Literature
Fr	3	(or Gm 3) Intermediate French or Intermediate German	Fr	4	(or Gm 4) Intermediate French or Intermediate German
Pe	1	Physical Education	Pe	2	Physical Education
Zo	3	Animal Biology, or Ms 5, Elements of College Mathematics	Sh	1	Funds. Public Speaking
			Zo	4	Animal Biology, or Ms 6, Elements of College Mathematics

Sophomore Year

Py	1	General Psychology	Py	2	General Psychology
Ay	1	Introduction to Anthropology or Sy 3, Introduction to Sociology	Ay	2	Introduction to Anthropology or Sy 4, Introduction to Sociology
		Foreign Language, if not completed in freshman year			Foreign Language, if not completed in freshman year
		Humanities course			Humanities course

Sociology recommended electives: Py 1/2, General Psychology; Ec 1/2, Principles of Economics; Pol 1/2, Introduction to Government. Social Welfare recommended electives: Pol 1/2, Introduction to Government.

Students who major in the Department of Sociology will establish, in consultation with their major adviser, the program for their junior and senior years. Consult this catalog for specific courses in the program areas offered by the department —sociology, and social welfare, and for department requirements concerning advanced courses.

Sociology (Sy)

3/4. Introduction to Sociology—The fundamental concepts, principles, and methods of sociology; analyzes the influence of social and cultural factors upon human behavior; evaluates effect of group processes, social classes, stratification, and basic institutions on contemporary society. The first semester (Sy 3) concentrates on concepts and principles; the second semester (Sy 4) on application of these to various social problem areas. *Cr* 3. STAFF

5ed. Sociology of Education—The major principles of sociology; the culture concept and its use in perceiving and understanding the diversity of the social system in relation to the school and education; discussion of school-community relationships, social groups, and pattern of social behavior. Offered concurrently with Mhe 50 and Py 70. Credits are not accepted toward the department major. *Cr* 3. MR. SEZAK

6n. Sociology for Nurses—An introductory semester course which presents the fundamentals of sociology; description and analysis of the structure and dynamics of human society; social norms, intergroup relations, social change, stratification and institutions. Discussion of hospital-community relationships. A course for nurses at Eastern Maine General Hospital. Credits are not accepted toward the department major. *Cr* 2. MR. DEWITT

7. Marriage—A study of the factors involved in success and failure in marriage. Research in the social, psychological and biological sciences is applied to common personal problems of courtship, marriage and parenthood. Open to all students in the University. No prerequisite. Credits are not accepted toward the department major. *Cr* 2. MR. STEIN

24. Sociology of Rural Life—Significance of rural society in American culture. The impact of forces of change, including population movement. The significance of changes in the institution of family, religion, education, and stratification. The course is the same as Ab 24. *Cr* 3. MR. GAMACHE, MR. PLOCH

110. Social Organization—An examination of selected institutions in modern society, analysis of social roles, processes and structures within typical organized groups, such as industrial, military, religious and fraternal organizations; discussion of bureaucracy, decision making, social conflict; the implication of cultural and technological change. Prerequisite: Sy 3 or permission of instructor. *Cr* 3. MR. BOLARIA

113. Social Disorganization—The origins and causes of socially disapproved behavior: ways in which society interprets and copes with the deviant. Study of the major forms of social disorganization; specific social problems are considered, such as suicide, crime, drug addiction, alcoholism, prostitution, mental illness, divorce, group conflict. Prerequisite: Sy 3 or permission of the instructor. *Cr* 3. MR. DEWITT

114. Social Change — Analysis of sociocultural factors related to social change and the dynamics of the change process. Sy 3 or permission of the instructor. *Cr* 3. MR. DEWITT

115. Sociology of Adolescence—Attention is given to the social behavior of adolescents, the development of adolescent culture and the involvement of adolescents in the various social systems and the class structure of society. Prerequisite: Sy 3 or permission of instructor. *Cr* 3. MR. SCIMECCA

118. Sociology of the Family—A sociological approach to the study of the family, including the structure of social relationships, the modern American family as a social institution, the cultural background of the family, and the impact of social change. Prerequisite: Sy 3 or permission of the instructor. *Cr* 3. MR. SEZAK, MR. STEIN

119. Statistical Methods for Sociological Research—Emphasis on the uses of statistics in the organization, interpretation and presentation of sociological research data. Prerequisite: Ms 19 or permission of the instructor. *Cr* 3. MR. NOLAN, MR. TENNANT

120. Methods of Social Research—An introductory research course. Nature of scientific social inquiry; problem formulation; sources of data; basic methods and techniques; use of specific tools in social research; theoretical relation between data collection and findings. Field studies. Prerequisite: Sy 3, Sy 119, or permission of instructor. *Cr* 3. MR. NOLAN, MR. TENNANT

121. Juvenile Delinquency—The problem of adolescence in modern society. Discontinuities of teenage roles; influence of various subcultures on patterns of behavior; problems of the adolescent in his social environment; delinquency as a social problem; theories of delinquency causation; issues, programs. Prerequisite: Sy 3, or permission of instructor. *Cr* 3. MR. NOLAN

122. Criminology: The Adult Offender — Social and cultural factors in the causation of crime among adults; organized crime as a social phenomenon in

American life; specific types of criminal careers; legal and judicial aspects of crime. Prerequisite: Sy 3, or permission of instructor. *Cr* 3. MR. NOLAN

123. Social Stratification—Systematic analysis of social differentiation and evaluation. Theories of, and research in, the structure and function of class, caste, and ethnic stratification. Descriptive materials will be drawn from studies of American and other societies. Prerequisite: Sy 3, or permission of instructor. *Cr* 3. MR. NOLAN, MR. TENNANT

125. Industrial Sociology—Social factors involved in the development of industries; social consequences of technological change; social organization within industry; problems encountered within the social structure(s) of industry. Prerequisite: Sy 3, or permission of instructor. *Cr* 3. MR. BOLARIA

126. Sociology of Urban Life—A descriptive and analytical appoach to the study of city life. Emphasis is placed on environment, social organization, the ecological processes, population, areas, housing, and maladjustments. No freshmen. Prerequisite: Sy 3, or permission of the instructor. *Cr* 3. MR. SEZAK, MR. SCIMECCA

129. The Individual and the Community—Analysis of the functioning and structure of the community. Emphasis on ways in which individuals and groups are affected by community dynamics. Group processes, leadership, program planning and development are stressed. Community project. Prerequisite: Ab/Sy 24 or Sy 26 or permission. Course same as Ab 129. *Cr* 3. MR. PLOCH

134. Population—Theories of population. Demography; analysis of birth, death, and migration trends. Problems and policies. Prerequisite: Sy 3/4 or permission of instructor. *Cr* 3. STAFF

135. Human Ecology—Spatial distribution of human beings and related activities and social processes. Prerequisite: Sy 3 or permission of instructor. *Cr* 3. STAFF

138. Race and Culture Conflict—Analysis of factors involved in group conflict, with emphasis on minority groups in culture contact situations. Prerequisite: Sy 3 or permission. *Cr* 3. STAFF

140. Social Control—Examination and comparison of major control mechanisms used in sacred and secular societies. Emphasis on various institutions of social control and their role in establishing and maintaining social order. Sy 3 or permission of the instructor. *Cr* 3. STAFF

160. Sociological Theory—A critical examination of the sociological theories of Marx, Max Weber, Durkheim, and contemporary theorists such as Parsons and Robert Merton. Study of developments in sociological theory as related to methodology, social issues, and current trends in contemporary sociology. Prerequisite: Sy 3 and two other courses in sociology, or permission of the instructor. *Cr* 3. MR. MANEKER

161. History of Sociology—Trends and leading figures in the history of sociology. Survey of current approaches and established principles in the field. Prerequisite: Sy 3 and two other courses in sociology, or permission. Seniors only. *Cr* 3. MR. NOLAN, MR. SCIMECCA

169. Collective Behavior and Social Movements—Behavior of groups such as mobs, crowds, and riots which involve little cultural direction. Relatively unstructured mass behavior and broad society-wide movements are analyzed. Sy 3 or permission of the instructor. *Cr* 2. MR. MANEKER

170. Small Group Analysis—Communication and interaction patterns with-

in small groups are identified and analyzed. Course involves participation in and observation of such interaction. Prerequisite: Sy 3 or permission of instructor. *Cr* 3. MR. MANEKER

171. Sociology of Medicine—Attention is given to the relationship between sociocultural factors and the occurrence of disease and the social systems which are developed in the treatment and prevention thereof. Prerequisite: Sy 3/4 or permission of instructor. *Cr* 3. MR. MANEKER, MR. BOLARIA

180. The Science of Social Man—The course will review and seek to integrate to the extent possible, basic concepts, theoretical systems and methodological issues in the behavioral sciences. It will be inter-disciplinary in nature and help the student understand the degree to which a unified science of man has been approached, as well as the problems yet to be resolved. It will also consider the implications of outstanding recent contributions. It will be jointly taught by members of this department as well as by other faculty who may be invited to participate. Prerequisite: senior sociology majors or permission of instructors. *Cr* 3. STAFF

182. Sociology of Religion—An objective study of religion as a social institution. Attention is given to the social correlations of religion and the functions of religion in society. Prerequisite: Sy 3 or permission of instructor. *Cr* 3. MR. DEWITT

197/198. Department Projects—For the advanced student. Minimum of 15 hours of department courses as a prerequisite. Apply directly to Professor Sezak before registration. *Cr* 2 or 3.

219. Intermediate Quantitative Methods in Sociology—Survey of intermediate and advanced quantitative methods used in sociological research. Special emphasis is placed on the sociological application of nonparametric and multivariate technics. *Cr* 3. Prerequisite: Sy 119 or equivalent. MR. NOLAN, MR. TENNANT

240. Seminar on Action Sociology—The application of sociological theory to social problems, with a view to defining, analyzing, and solving those problems. Prerequisites are: Sy 3, Sy 4, Sy 120, Sy 160. *Cr* 3. MR. MANEKER

297. Directed Research *Cr Ar.*

298. Directed Readings *Cr Ar.*

305. Advanced Sociology of Education—An analysis of the social processes and social patterns involved in the educational system. Selected problems in the sociology of education will be given intensive study. Individual research will be required. *Cr* 3. MR. SEZAK

310. Seminar in Social Organization—Attention is given to the relationships between social variables that contribute to the organization of society. Inter-institution as well as intra-institution relationships are considered. *Cr* 3. MR. BOLARIA

313. Seminar in Social Disorganization—Attention is given to the interrelationships of social variables and to the factors that hinder the effective functioning of the group. *Cr* 3. MR. DEWITT, MR. NOLAN

318. Advanced Sociology of the Family—A comparative analysis of family organization among selected societies. Special emphasis will be focused on the nuclear family of Western society, relating the structure and function of the family to broader forms of social organization. Individual research will be required. *Cr* 3. MR. SEZAK, MR. STEIN

320. Seminar in Research Methods—Advanced course for those who intend to do research or graduate work. Attention is paid to various methods and techniques used by sociologists. *Cr* 3. MR. NOLAN, MR. TENNANT

326. Seminar in Formal Organization—Examination of the nature and types of formal organizations, the relationships between them and the larger social context of which they are a part, and various aspects of their internal structure. Major emphasis is on theoretical orientations and methodological considerations. *Cr* 3. MR. BOLARIA

329. Seminar in Community Studies—Changes in the structure and function of rural, suburban and urban communities and of their interrelationships and relationships with the larger society. Emphasis upon theory and research. *Cr* 3. STAFF

360. Seminar in Sociological Theory—Considers the development of major sociological theories, with attention given to the relationship of such theories to the understanding of social behavior and to contemporary research. *Cr* 3.
MR. MANEKER, MR. TENNANT

368. 369. Manpower Research Seminar—An examination of the economic, social, and psychological factors affecting manpower development and utilization. This inter-disciplinary seminar is part of the University's manpower research project. It gives students a unique opportunity to participate in current research, from problem formulation to data collection and analysis. *Cr* 3.
Course same as Ba Py Ec 368.369. By permission.
MR. CLARK, MR. FORSGREN, MR. BOLARIA, MR. STONE

371. Seminar in Medical Sociology—Attention is given to the medical and allied health professions, the relationship between the medical profession and the state, and society and health care institutions. Emphasis is also placed on the professional work-role relationships of medical and para-medical personnel in various health-service-systems and health institutions and delivery of health services. Theoretical and empirical research problems are also stressed. MR. BOLARIA

382. Advanced Sociology of Religion—Advanced study of the social dimensions of religion. Particular emphasis is placed on current research and theory. *Cr* 3. MR. DEWITT

399. Graduate Thesis—*Cr* 6.

Social Work (Sw)

150/151. Social Welfare—Study of social welfare as a social institution. An examination of social welfare programs, their philosophy and methods, within a social and cultural context. Prerequisite: Ay 1/2 or Sy 3. *Cr* 3.
MR. SALEEBEY

152/153. Social Work as a Profession—Study of the ideology and methods of the social work profession. An examination of the role of the social worker in modern society, and the relationship of social work to other helping professions: psychology, psychiatry, medicine, and the ministry. Prerequisite: Sy 150/151, seniors, or permission of instructor. *Cr* 3. MR. SALEEBEY

154/155. Field Experience in Social Work—Field observation and experience in community agencies to enable students to apply social science and social welfare knowledge and to test their motivation and capacity for the field of social work. Prerequisite: seniors and permission of instructor. *Cr* 3.
MR. SALEEBEY

SPEECH (Sh)

PROFESSORS GARDNER AND BRICKER; ASSOCIATE PROFESSORS BOST, COLBATH, COOK, DOPHEIDE, GILLESPIE, PETTIT AND SCHER; ASSISTANT PROFESSORS W. BURNS, E. CYRUS, HARTMAN AND RICE; INSTRUCTORS MR. F. BURNS, MR. W. DEVINE AND MR. DOUGLASS, MRS. MOWER AND MRS. PICKERING; GRADUATE ASSISTANTS MR. BOWERS, MR. DAVIS, MR. FURMAN, MR. PAYNE, MISS WILBUR AND MISS YOUNG

The major studies may lead to either a B.A. degree in speech or a B.A. degree in theatre. In addition, the major in speech permits the student, by meeting special requirements, to concentrate in one of the following areas: broadcasting; rhetoric and public address; speech education; or speech pathology and audiology.

Departmental courses required of all speech or theatre majors are Sh 1, Sh 31, Sh 41, and Sh 198, plus additional hours as prescribed by the major and/or area of concentration. Specific requirements for each are available at the departmental office, including suggestions for preferred courses in meeting college requirements.

All majors are expected to take advantage of the laboratory opportunities offered by the department through University Forensics, the Maine Masque Theatre, WMEB-FM and WMEB-TV, and the Speech and Hearing Clinic.

The department offers programs leading to the master of arts degree. Further details may be found in the Graduate School Catalog.

Courses in Rhetoric and Public Address (Sh)

The University forensic program offers practical experience in debate, discussion, oratory, and extemporaneous speaking through competition with other colleges and universities. All undergraduate students in the University may participate in the program.

1. Introduction to Oral Communication—An analysis of the basic elements of interpersonal oral communication in modern society. Experience in the preparation, presentation, and analysis of representative speaking experiences. *Cr* 3.
MR. W. BURNS, CHAIRMAN

4. Introduction to Discussion and Debate—Principles and methods used by individuals and groups in discovering and supporting intelligent decisions on controversial issues. Emphasis on the interrelatonship of thought, speech, and social action in classroom experiences. *Cr* 3. MR. DOUGLASS, MRS. HARTMANN

9. Parliamentary Procedure—The principles and methods by which groups organize themselves and transact business with efficiency and fairness. *Cr* 1.
MR. GARDNER

51. 52. Debate Laboratory—Practical application of the principles and procedures of debate through the University of Maine Forensic Program. Prerequisite: Sh 4 or permission. *Lab* 2, *Cr* 1. STAFF

101. Advanced Public Speaking—An examination of the problems and principles of the types of speech common to contemporary life. Classroom experience in the preparation and presentation of speeches. Prerequisite: Sh 1 or 4. *Cr* 3.
MR. COOK

103. Speech Analysis and Criticism—Study of the nature, significance, and influence of public speech with emphasis on the problems and methods in

description, analysis, and evaluation of the speech situations. Prerequisite: Sh 1 or 4. *Cr* 3. MR. DOUGLASS

105. Group Discussion—The theory and methods of group procedures in problem-solving. Emphasis on current theories in group methods and participation in group discussions. Prerequisite: Sh 4. *Cr* 3. MRS. HARTMANN

107. Argumentation—Concepts, principles, and procedures of reasoned discourse, with emphasis on the process of critical decision-making through debate and persuasion. Prerequisite: Sh 4. *Cr* 3. MR. GARDNER

155. American Public Address—Consideration of representative American speakers from colonial times to the present. A critical analysis of the materials, structure, and style of selected speeches. Prerequisite: Sh 1 or 4. Sh 103 is recommended. *Cr* 3. MR. W. BURNS

158. Directing the Forensic Program—An analysis of the duties, responsibilities, and opportunities of the director or coach of extemporaneous speaking, oratory, discussion, and debate, with attention to the training procedures in these areas. Limited to juniors and seniors. Prerequisite: Sh 4 or permission. *Cr* 3.

202. 20th Century Public Address—An examination of the speaking of modern world leaders, with emphasis on their speech practices and their handling of dominant issues. Prerequisite: six hours in rhetoric and public address or permission. *Cr* 3. MR. W. BURNS

204. Persuasion—Studies of current research findings on means of influencing the audience. Consideration of those speech factors which motivate change in human affairs. Prerequisite: six hours in rhetoric and public address or permission. *Cr* 3. MR. W. BURNS

206. Survey of Rhetorical Theory—Major developments and basic issues in rhetorical theory from the early Greeks to the present day. Examination of prominent rhetoricians and their relationship to current thought. Prerequisite: six hours in rhetoric and public address or permission. *Cr* 3. MR. DOUGLASS

208. Communication Theory—An advanced study of the phenomena of human communication; how experience is perceived, interpreted, processed, encoded and used in intrapersonal, interpersonal, and public communication. Prerequisite: six hours in speech or permission. *Cr* 3. MR. W. BURNS

Courses in Theatre (Sh)

The Maine Masque Theatre presents four major productions each year, in addition to other laboratory or studio programs, and serves as a practical training ground in theatre. All students in the University are eligible to read for plays to be produced and may participate in the other areas of the theatre.

11. Introduction to Theatre—An introduction to the basic elements of theatre and an examination of its place in society. Consideration of present conditions in educational, community, and professional theatre. *Cr* 3. MR. BRICKER

14. 15. Stagecraft—An introduction to technical production in the areas of scene design, lighting, costumes, properties, and makeup. Projects and laboratory work associated with theatre productions will be required. Fall semester: scene design and lighting; Spring semester: costumes, properties and makeup. Sh 11 recommended. *Lec* 2, *Lab* 2, *Cr* 3. MR. CYRUS

16. Play Production—An introduction to the responsibilities of the director and to the basic principles of stage directing, including choosing and analyzing plays, scheduling rehearsals, blocking action, and determining stage business.

Backstage work on major and laboratory theatre productions will be required. *Lec* 2, *Lab* 2, *Cr* 3. MR. BRICKER

17. Fundamentals of Acting—The basic skills of acting, including the actor's internal preparation for playing a role and the development of his external techniques for projecting the role to his audience. *Lec* 2, *Lab* 2, *Cr* 3. MR. BRICKER

68. Theatre Practicum—Students will be assigned specific responsibilities in the operation of the Maine Masque Theatre. Prerequisite: 12 hours of theatre courses and permission. May be repeated for a maximum of three hours. *Cr* 1. STAFF

161/162. Theatre History — A study of the development of the drama physical theatre, and modes of production. Fall semester: Greek theatre through the Renaissance. Spring semester: Restoration to the present day. Limited to juniors and seniors. *Cr* 3. MR. BOST, MR. COLBATH

†***163. Scene Designing***—Principles, methods, and materials used in scene designing. Laboratory projects in preparing the complete design for a particular production, including drawings and plans. Prerequisite: Sh 14.15. *Cr* 3. MR. CYRUS

‡***164. Stage Lighting***—Principles, methods, and materials used in stage lighting, including their artistic and technical applications. Projects will include problems in lighting particular productons. Prerequisite: Sh 14.15. *Cr* 3. MR. CYRUS

165. Stage Costuming—An introduction to aspects of stage costuming, including history, aesthetic principles, and practical application to actual productions. Prerequisite: Sh 14.15. *Cr* 3.

166. Stage Directing—The translation of all aspects of the theatre production into an artistic unity. Emphasis on theatre aesthetics. Practice in the directing of short plays, with particular attention to the director's work with the actor. Prerequisite: Sh 16. Limited to juniors and seniors. *Lec* 2, *Lab* 2, *Cr* 3. MR. COLBATH

167. Advanced Acting—Development of the individual actor's versatility, with emphasis on the actor's exploration of himself as an instrument. Practice in broadening basic acting skills, role interpretation, and characterization. Limited to juniors and seniors. Prerequisite: Sh 17. *Lec* 2, *Lab* 2, *Cr* 3. MR. BRICKER

260. Production of Pre-Modern Drama—An investigation of the problems involved in the presentation of selected pre-modern dramas, from Aeschylus to Ibsen. Prerequisite: permission. *Cr* 3. MR. CYRUS

261. Production of Modern Drama—An investigation of the problems involved in the production of selected examples of modern drama, from Ibsen to the more recent forms. Prerequisite: permission. *Cr* 3. MR. COLBATH

263. American Theatre—A study of the development of the American theatre from its beginning to the present day. Prerequisite: permission. *Cr* 3. MR. BOST

265. 266. Dramatic Theory—Analysis of the origin, form, content, theory, and criticism of tragedy and comedy. Fall semester: tragedy. Spring semester: comedy. Prerequisite: Sh 161/162 or equivalent. *Cr* 3. MR. BOST

267. Drama Colloquium—A study, in depth, of a play presented by the Maine Masque Theatre during the semester in which the colloquium is offered, together with the examination of other selected works by the same author. Participation in the production will be required. (Spring semester, 1970 — "Mother Courage" by Bertolt Brecht.) Prerequisite: permission. *Cr* 3. MR. COLBATH

369. Theatre Laboratory—Advanced laboratory work in the areas of direct-

ing, designing, or lighting. Students may repeat the laboratory for credit in subsequent semesters, but may not receive credit in the same area more than once. Prerequisite: in directing, Sh 166; in designing, Sh 163; in lighting, Sh 164. *Cr* 3.
STAFF

Courses in Broadcasting and Film (Sh)

Radio Station WMEB-FM provides practical experience in broadcasting. All students have the opportunity to work for staff positions and program assignments. Certain opportunities are available on University television station WMEB-TV.

21. Introduction to Broadcasting and Film—Survey of the nature of the mass communications media of radio, television, and film in America, developmental history, social and economic influence, philosophy, and systems of content and dissemination. *Cr* 3. MR. SCHER

22. Basic Audio Techniques—The role of sound in radio, television, and film. Basic considerations of equipment, audio patterns, and voice requirements. Emphasis on the role of the announcer and narrator. *Lec* 1, *Lab* 4. *Cr* 3.
MR. DEVINE

23. Radio Laboratory—Practicum in the functions of radio programming and production. Students will be assigned specific responsibilities in the operation of WMEB-FM. Prerequisite: three hours of broadcasting courses and permission. May be repeated for a maximum of three hours. *Cr* 1. MR. DEVINE

170. Broadcasting and Government—A study of the relationship between station operation and governmental policy or regulation. Special emphasis on the licensee's public service responsibilities as established by legislative and judicial precedents. Prerequisite: Sh 21. *Cr* 3. MR. SCHER

171. Writing for Broadcasting—An analysis of the problems in writing for radio and television. The preparation of different forms of continuity copy and the creation of various types of programs. Prerequisite: Sh 22 or permission. *Cr* 3.
MR. SCHER

172. Advanced Audio Techniques—Production of audio patterns for the mass media. Emphasis on the art of the radio production and the television or film soundtrack as an aesthetically composite whole. Prerequisite: Sh 22 or permission. *Cr* 3.

173. Basic Television Production—An introduction to the theory and processes of television production. Emphasis on the use of television equipment, its potentials and limitations. Prerequisite: Sh 22 or equivalent. *Lec* 2, *Lab* 2, *Cr* 3.

174. Advanced Television Production—An analysis of the problems involved in the creation, production, and direction of the television program. Emphasis on the total production as an aesthetic whole. Prerequisite: Sh 173 or equivalent. *Lec* 1, *Lab* 4, *Cr* 3.

175. Film in Television—Basic film techniques as they relate to television. Analysis of the problems in planning, producing, and editing. Prerequisite: Sh 22 or permission. *Lec* 2, *Lab* 2, *Cr* 3. MR. SCHER

176. Broadcast Programming—The problems in planning, preparing, and scheduling programs for radio and television. Major consideration to the interrelationships of audience analysis, station policy, advertising needs, and industry or federal guidelines. Prerequisite: Sh 21 or permission. *Cr* 3.

177. Using Television in the Classroom—The values and potentials of utilizing radio and television in education, with particular emphasis on current

use of the media in elementary and secondary schools, colleges and universities, and adult education. *This is not a course in producing the instructional program.* Limited to juniors and seniors. *Cr* 3. MR. SCHER

178. Televised Instruction—Problems in preparing televised courses and course segments. Consideration of the roles of the producer, television teacher, content consultant, and support personnel, as well as their relationships to the various forms of televised instruction. Prerequisite: Sh 177 or permission. *Cr* 3.

272. Comparative Systems of Broadcasting and Film — A systematic analysis and evaluation of radio, television, and film in major foreign countries. Consideration of the social and economic influence both within the individual country and on world society. Prerequisite: Sh 21 and permission. *Cr* 3.

MR. SCHER

Courses in Speech Pathology and Audiology (Sh)

The Speech and Hearing Clinic is available for both diagnosis and therapy for all who can benefit from its services. It also provides training opportunities for those who are preparing to become speech therapists.

31. Voice and Diction—Designed to establish good speech habits through an understanding of the vocal mechanism and instruction in the development, care, and use of the speaking voice. *Cr* 3. MR. GILLESPIE, Chairman

32. Phonetics — A study of the formation, auditory recognition, and phonetic (IPA) transcription of the sounds of the English language, with an examination of the interrelationship of such sounds in connected speech. *Cr* 3.

MR. GILLESPIE

180. Language and Speech Development—An examination of the psychological and sociological foundations of language development and the sequential aspects of speech development. The interrelationships of the natural and behavioral sciences in understanding the speech and language processes. Limited to juniors and seniors or by permission. *Cr* 3. MR. GILLESPIE

181. Introduction to Speech Pathology—A survey of the major disorders of speech with attention to their recognition and the principles of their treatment. Recommended for all teachers. Limited to juniors and seniors or by permission. *Cr* 3. MR. DOPHEIDE, MR. PETTIT

182. Fundamentals of Speech Pathology—A professional orientation to the diagnosis and treatment of speech disorders presented by school age children. Emphasis on the interpersonal therapeutic experience and basic clinical procedures. Supervised observations of therapy will constitute a portion of the course. Prerequisite: Sh 181. *Lec* 2, *Lab* 2, *Cr* 3. MR. DOPHEIDE

183. Anatomy and Physiology of the Speech Mechanism—Study of the structures, the muscular system, and the nervous system underlying breathing, phonation, articulation, and language. While emphasis is placed on normal neurophysiological function, attention is directed to organic pathologies affecting speech and language. Limited to juniors and seniors. *Cr* 3. MR. DOPHEIDE

184. Basic Research in Speech and Hearing Science—An introduction to research findings on the importance of acoustical, physiological, and perceptual factors in speech production and reception. Methodology and instrumentation employed in such research are surveyed. Limited to juniors and seniors. *Cr* 3.

MR. PETTIT

185. 186. Clinical Practicum I—Supervised experience with selected clients in the University of Maine Speech and Hearing Center. Three hours weekly participation. plus weekly conference. Prerequisite: Sh 182 and permission. *Cr* 1.
STAFF

187. Language Disorders—A study of the etiological factors, diagnostic procedures, and therapeutic methodology relevant to the clinical management of language disorders of both adults and children. such as adult aphasia, delayed language development, and language disability associated with mental retardation. Prerequisite: six hours in speech pathology. *Cr* 3. MR. PETTIT

188. Introduction to Audiology—The basic anatomy and physiology of the ear; theories of hearing; causes and types of hearing loss; and the administration of basic pure-tone and speech tests of auditory function. Limited to juniors and seniors. *Cr* 3. MR. F. BURNS

281. Articulation Disorders—An analysis of articulation disorders having a functional or organic etiology. Thorough consideration of diagnostic practices and therapeutic procedures appropriate to misarticulations stemming from varied causes. Prerequisite: Sh 182 and 183. *Cr* 3. MR. GILLESPIE

282. Voice Disorders—An analysis of the types, symptoms, and causes of abnormal voice production. Consideration of diagnostic practices, medical and psychological referral procedures, and methods used in correction of vocal problems of pitch, intensity, rate, and quality. Prerequisite: Sh 182 and 183. *Cr* 3.
MR. GILLESPIE

283. Stuttering—Study of the causation, diagnosis, and treatment of stuttering behavior as viewed from various theoretical orientations. The clinical management of both children and adults who stutter is emphasized. Prerequisite: Sh 182 or permission. *Cr* 3. MR. DOPHEIDE

288. Aural Rehabilitation—Consideration of the effects of hearing loss upon the personal and social development of the individual. Study of the principles and procedures of auditory training and speech reading as approaches to language development in the hearing-handicapped person. Prerequisite: Sh 188 or permission. *Cr* 3.

386. Clinical Practicum II—Supervised clinical experience in both individual and group therapy, plus diagnostic procedures, at the University of Maine Speech and Hearing Center and other sites. Weekly supervisory conference and minimum of three contact hours weekly for each credit hour. May be repeated to maximum of four credits. Prerequisite: permission. *Cr* 1-2. STAFF

Courses in Oral Interpretation (Sh)

41. Fundamentals of Interpretation—An introduction to the art of interpretation in order to stimulate an understanding and responsiveness to literature and to develop the ability to convey to others, through oral reading, an appreciation of that literature. *Cr* 3. MRS. RICE, Chairman

190. Choric Speaking—Application of the basic principles of oral reading to the problems of group interpretation of literature. Emphasis on methods, materials, and actual participation in group reading. Limited to juniors and seniors. Prerequisite: Sh 41. *Cr* 3. MRS. RICE

192. Advanced Oral Interpretation—Consideration of the particular prob-

lems involved in the oral reading of the following: (1) prose, (2) poetry, and (3) drama. Limited to juniors or seniors or permission. Prerequisite: Sh 41. *Cr* 3.
MRS. RICE

General Courses (Sh)

195. 196. Problems in Speech—For the advanced student desiring to study a particular problem under the guidance of a member of the staff. Prerequisite: permission of the department chairman. *Cr* 1-3. STAFF

‡***197. Teaching of Speech***—Problems, methods, and materials related to the teaching of speech. Particular attention to the co-curricular speech program. Prerequisite: permission. *Cr* 3.

198. Seminar in Speech—Investigation of special problems and significant topics in the field of speech. Oral and written reports. Prerequisite: 15 hours of speech or permission. *Cr* 3. MR. GARDNER

301. Seminar in Research Methods—Study of significant and current research, with an analysis of methodology and findings. Required of all graduate students. Prerequisite: permission. *Cr* 3. MR. W. BURNS

302. Teaching Speech in College—Designed to aid teaching assistants and other graduate students in learning and using effective methods in teaching basic courses. *Cr* 1. MR. GARDNER

390. 391. Directed Research—The opportunity to study a particular problem under faculty supervision. Prerequisite: permission of the chairman of the department. *Cr* 1-3. STAFF

399. Graduate Thesis—*Cr Ar.*

ZOOLOGY (Zo)

PROFESSORS ALLEN, MURRAY, SPEICHER, MEYER, FLYNN, BARDEN, DEAN, PRATT; ASSOCIATE PROFESSORS HATCH, MAJOR, MUN*, SASS, COOK, VALLEAU**, ROBERTS, DEARBORN, HAYNES; ASSISTANT PROFESSORS MCALICE, MCCLEAVE, VADAS, DEWITT; LECTURERS PORTER, RODERICK, SCHLAGER, WADSWORTH, RIDGEWAY, KANDUTSCH, STEVENS, FELL, BAILEY, CHERRY, POTTS, RUSSELL; POST-DOCTORAL FELLOW DOLPHIN; TEACHING ASSOCIATE BLAKE; PART-TIME INSTRUCTORS WEATHERBEE, COOK, MAJOR; GRADUATE ASSISTANTS CLARK, KAISER, LEACH, WALLACE, WOOD, DEZELL, KESSLER, NOYES, TURNER, VIGUE

Zoology, or animal biology, includes the study of every aspect of animal life: the structure of animals, their development, functions, heredity, and interactions with other organisms and their environment. The department's introductory course, Zo 3/4, Animal Biology, fulfills one year of the college requirement of a basic year course in laboratory science or mathematics. This course, or a combination of Zo 3 and Bt 1, General Botany, is a prerequisite to all advanced courses in the department.

*On leave of absence 1969-70.
** On leave of absence fall semester, 1969-70.

A zoology major is prepared for graduate training in biology, for entrance into medical or dental school, or for medical technology. Specimen curricula for several of these fields are given in this catalog and should be carefully considered by the student in planning a program. Other curricula can be worked out in consultation with the department head.

Upon graduation a zoology major may also enter various fields: business, education, industry, government agencies, and research laboratories. Among the positions held by zoology majors the following may be mentioned: museum curator, research assistant, teacher, hospital administrator, librarian, biological aide, aquatic biologist, ranger-naturalist, biological supply house employee, book publisher's representative, medical and biological illustrator, and science writer.

FISHERY SCIENCE

A zoology major may elect a sequence of courses introducing the basic skills necessary for careers in fishery management and biological oceanography. Graduates of this sequence are eligible for Civil Service examinations for positions at the technician level in federal and state agencies concerned with management of aquatic resources. More advanced positions in these fields generally require graduate preparation. Undergraduates anticipating graduate study are urged to secure a broad base in the biological and physical science. The zoology major requirements are ideally suited to such preparation.

A graduate program in Fishery Science leading to the degrees of master of science and doctor of philosophy is offered in the Department of Zoology. Opportunities for research in fresh water and estuarine environments are available through the cooperation of state and federal agencies. Research assistantships are usually available for graduate students.

The Maine Department of Inland Fisheries and Game has maintained close liaison with the University fishery science program for 25 years. Natural populations of warm water and cold water game fish abound in the state, providing unlimited opportunity for field study. Two fish cultural stations nearby provide facilities for controlled studies on large groups of fish.

The Maine Cooperative Fishery Unit, the second such unit established in the nation, provides opportunities for training and research in the field of fishery science. The unit is operated under a cooperative program by the U. S. Fish and Wildlife Service, Bureau of Sport Fisheries and Wildlife, the Maine Department of Inland Fisheries and Game, and the University. The unit offers advanced training in modern fishery management and research techniques, conducts a program of fishery research, and participates in extension programs.

Preparation for the Zoology Major

In addition to the general requirements of the college, the department requires the following courses for the B.A. degree in zoology:

Zo 3/4, Animal Biology

Ch 13/14, General Chemistry

Ch 151/152, 161/162, Organic Chemistry (with lab), or Bc 21. Organic Chemistry and Bc 122. Biochemistry

Ms 12, Calculus; Ms 19, Principles of Statistical Inference

Ps 1a/2a, General Physics

Requirements for the Zoology Major

Twenty-two hours of advanced work in zoology are required. The following courses must be included in the advanced work in zoology:

Zo 133, Comparative Anatomy or Zo 136, Developmental Biology
Zo 162, Genetics
Zo 177, Animal Physiology

Courses in Zoology (Zo)

3/4. Animal Biology—A basic two-semester course. The first semester deals with principles of life, including properties of cells, heredity, ecology, evolution and a brief review of major invertebrate types. The second semester is an introduction to vertebrate structure and function, with emphasis placed on basic physiological principles. *Lec* 2, *Lab* 4, *Cr* 4. MR. SPEICHER, MR. VALLEAU

5. Anatomy and Physiology for Nurses—The general principles of animal life, emphasizing the structure and functions of the human body. Restricted to three-year student nurses. *Lec* 3, *Lab* 3, *Cr* 5. MR. SASS

7. Man's Ocean—An introduction to the ocean currents, changes in the ocean floor, productivity, and man's relation to the sea. This course is especially designed for the high school teacher and will be taught at The Darling Center only. *Lec* 3, *Lab* 4, *Cr* 4. MR. GRAHAM

8. Anatomy and Physiology—The general principles of animal life, with emphasis on the structure and functions of the human body. Prerequisite: Zo 3 or chemistry. Students who have had Zo 3/4 should take Zo 133 rather than Zo 8. *Lec* 2, *Rec* 1, *Lab* 2, *Cr* 4. MR. SASS

10. Anatomy and Physiology—Similar to Zo 8, with additional time for laboratory. For students in the School of Nursing. Prerequisite: Zo 3. *Lec* 2, *Rec* 1, *Lab* 4, *Cr* 5. MR. MURRAY

12. Organic Evolution—The biological development of higher forms of life from the simpler, the evidence which support this fact and the processes which bring it about. Open to all non-majors above freshman standing. Not given every year. *Lec* 2, *Cr* 2.

131. Vertebrate Biology—An introduction to the classes of vertebrates: their characteristics, evolution, ecology, and systematics. Emphasis in laboratory is on taxonomy of regional fauna. Prerequisite: Zo 3/4 or Zo 3-Bt 1. *Lec* 3, *Lab* 2, *Cr* 4. MR. MCCLEAVE

133. Comparative Anatomy—The structure, origin, and history of the vertebrate organ-systems. Prerequisite: Zo 3/4, or permission of instructor. *Lec* 2, *Lab* 4, *Cr* 4. MR. FLYNN, MR. MURRAY

136. Developmental Biology—The transformation of the fertilized egg into a new adult individual: the concepts of growth and development of organisms. Prerequisite: Zo 3/4. *Lec* 2, *Lab* 4, *Cr* 4. MR. MUN

137. Comparative Embryology—A comprehensive approach to the early embryological phases of selected invertebrate and vertebrate forms, with emphasis on living development and embryological techniques. Prerequisite: two years of zoology. *Lec* 2, *Lab* 4, *Cr* 4. MR. HAYNES

139. Mammalogy—The characteristics of mammals, their life histories and economic importance. Lectures supplemented by laboratory study of skins and mounted specimens. Prerequisite: Zo 3/4 or Zo 3-Bt 1. *Lec* 2, *Lab* 3, *Cr* 3.
MR. BARDEN

151. Histology—Microscopic anatomy of animal tissues and methods of preparing microscopic slides. Prerequisite: Zo 3/4 or Zo 3-Bt 1. *Lec* 2, *Lab* 4, *Cr* 4. MR. ROBERTS

152. Animal Microtechnique—Histological and histochemical techniques in the preparation of animal tissues for microscopic study. Prerequisite: Zo 3/4 or Zo 3-Bt 1. *Lab* 4, *Cr* 2. MR. ROBERTS

153. Invertebrate Zoology — The morphology, physiology, life histories, phylogenetic relationship, and economic importance of invertebrates exclusive of insects. Prerequisite: Zo 3/4 or Zo 3-Bt 1. *Lec* 2, *Lab* 4, *Cr* 4. MR. MEYER

156. Animal Ecology—The interrelationships between animals and their physical and biotic environment. Topics include essentials of existence, ecosystem concepts, energy relationships, populations, communities, distribution, adaptations and applications. Prerequisite: Zo 3/4 or Zo 3-Bt 1. *Lec* 2, *Lab* 4, *Cr* 4, several required field trips. MR. DEARBORN

158. Animal Parasitology—The life histories, economic importance, methods of control, host necropsy and the preparation of parasites. Prerequisite: Zo 3/4 or Zo 3-Bt 1. *Lec* 2, *Lab* 4, *Cr* 4. MR. MEYER

160. Ornithology—The characteristics of birds, their life histories and economic importance. Lectures, laboratory study of skins and mounted specimens, and field identifications. Prerequisite: Zo 3/4 or Zo 3-Bt 1. *Lec* 2, *Lab* 4, *Cr* 4. MR. BARDEN

162. Principles of Genetics — The nature of hereditary factors and the mechanisms by which they are transmitted and expressed. Prerequisite: Zo 3 and Junior standing. *Lec* 3, *Cr* 3. MR. SPEICHER

164. Genetics Laboratory — Practical experience in the rearing of some genetically important laboratory species, and analysis of the resulting data. Prerequisite: Zo 162 or concurrently. *Lab* 4, *Cr* 2. MR. SPEICHER

168. Limnology—The ecology of inland waters, with primary emphasis on the physical, chemical and biological factors controlling productivity. Prerequisite: first-year courses in zoology and chemistry. Zoology 153, and Entomology are recommended. *Lec* 2, *Lab* 4, *Cr* 4. MR. HATCH

170. Introduction to Oceanography—Basic concepts in physical, geological, chemical, and biological oceanography. Prerequisite: one year each of mathematics, physics, chemistry, and biology, or permission of instructor. *Rec* 3, *Cr* 3. STAFF

171. Fish Management—Modern methods of fish management including propagation and distribution, fisheries legislation, biological surveys, and environment improvements. Prerequisite: Zo 131. *Lec* 2, *Lab* 4, *Cr* 4. MR. HATCH

177. Animal Physiology—Physiological processes in vertebrates with emphasis on the integration of organ systems. Prerequisite: at least one year of chemistry. *Lec* 2, *Lab* 4, *Cr* 4. MR. MAJOR

178. General Physiology—The vital phenomena common to all organisms. The effects of pressure, and temperature in biological systems. Membrane structure is treated in detail. Laboratory is a general methods laboratory. Prerequisite: Organic Chemistry and year of physics. *Lec* 2, *Lab* 4, *Cr* 4. MR. MAJOR

187. 188. Problems in Zoology—Open to juniors and seniors who have special interest and qualifications in some branch of zoology. Admission by permission of the head of the department. *Cr Ar.* STAFF

195.196. Zoology Seminar—Oral reports and discussion by class members, covering biological topics of current interest. *Rec* 2, *Cr* 1. STAFF

GRADUATE STUDY IN ZOOLOGY

The department offers work leading to the degree of master of science and doctor of philosophy, the general requirements for which are listed under Graduate Study.

A reading knowledge of French or German, preferably the latter, is a requirement for the advanced degree. In the major field, all courses numbered 200 or over are given primarily for graduate credit. All courses numbered 100 to 199 may be taken for graduate credit, with the prior approval of the student's advisory committee. Students may be required to take, without graduate credit, certain undergraduate courses which they lack.

Specific fields of interest for thesis subjects include cytology, ecology, experimental embryology, fishery biology, general physiology, genetics, invertebrate zoology, and parasitology.

Graduate Courses in Zoology

210. Marine Invertebrate Zoology—The morphology, functional anatomy, systematics and phylogenetic relationships of free-living marine invertebrates, excluding protozoans, with laboratory emphasis on studies of living material from the local fauna. Numerous field trips required. To be offered each summer at The Darling Center. Prerequisite: Zo 153 or equivalent. *Lec* 2, *Lab* 6, *Cr* 5. STAFF

232. Ichthyology—The characteristics, functional anatomy, life history, and ecology of fishes. Lectures, laboratory study, and field trips. Prerequisite: Zo 131, or permission of instructor. *Lec* 2, *Lab* 4, *Cr* 4. MR. MCCLEAVE

270. Advanced Topics in Aquatic Biology — A seminar-type course designed to acquaint the student with current research in biological oceanography and fishery science. May be repeated for credit. Prerequisite: permission of instructor. *Cr Ar*. STAFF

279. Experimental Endocrinology—A comprehensive survey of the vertebrate endocrine glands and their functional relationships. The experimental and comparative approach is emphasized. Prerequisite: Zo 3/4 or equivalent, Zo 177, and Organic Chemistry. *Lec* 2, *Lab* 4, *Cr* 4. MR. VALLEAU

280. Cell Mechanisms—A physico-chemical analysis of cell metabolism. Emphasis on mechanisms controlling growth and division. Prerequisite: Zo 3/4, Organic Chemistry or Biochemistry. *Lec* 3, *Lab* 4, *Cr* 4. MR. COOK

292. Functional Anatomy of Marine Invertebrates—Detailed studies of the functional anatomy of selected groups of marine invertebrates. Feeding and reproductive biology will be emphasized. Laboratory work will deal exclusively with live material. Prerequisite: Zo 153 or equivalent. *Rec* 1, *Lab* 4, *Cr* 3. MR. DEARBORN

337. Experimental Embryology—Causal analysis of the mechanisms, interactions, and genetic and biochemical factors in morphogenesis, neurogenesis and protein synthesis in the embryo. Prerequisite: Zo 136 or permission of the instructor. *Rec* 2, *Lab* 4, *Cr* 4. MR. MUN

352. Cytology and Cytogenetics—The problems of cell structure, cell division and the interrelation of cytology and genetics. Prerequisite: Zo 151 and

genetics, or permission of instructor. *Lec* 2, *Lab* 4, *Cr* 4. MR. SPEICHER

354. Advanced Genetics—Advanced consideration of hereditary phenomena with emphasis on current research in molecular, physiological and developmental genetics. Prerequisite: Zo 162 or equivalent. *Lec* 3, *Cr* 3. MR. ROBERTS

355. Faunistic Zoology—The collection, preservation, and identification of fresh water and terrestrial invertebrates (exclusive of insects) and of lower vertebrates; habits and life histories of selected forms. Prerequisite: Zo 153 or permission of instructor. *Lec* 2, *Lab* 4, *Cr* 4. MR. MEYER

357. Population Dynamics—Methods of estimating population size, growth rate and mortality rates, production and yield. Problems of predicting population fluctuations and cycles, theories of population harvest for maximum sustained yield, and various types of yield equation. Prerequisite: Ms 19, or Fy 247, or S 271, and calculus. Zo 156, Zo 171 or En 211 recommended. *Lec* 2, *Cr* 2. MR. HATCH

362. Estuarine Ecology—Analysis of the geology, physics, chemistry, and biology of the estuarine ecosystem. Prerequisite: Zo 156, Zo 168, Zo 170 or equivalent. *Rec* 2, *Lab* 4, *Cr* 4. STAFF

369. Biological Oceanography—The study of marine organisms and their interrelationships with the chemical, geological and physical aspects of their environment. Prerequisite: Zo 170 or permission of instructor. *Rec* 2, *Lab* 4, *Cr* 4. STAFF

380. Comparative Physiology—The physiological variations found in the animal kingdom and an interpretation of these variations in terms of evolutionary significance and ecological pressures. Laboratory will be irregularly scheduled as material is available. Prerequisite: Zo 177 or permission of instructor. *Lec* 2, *Lab* 4, *Cr* 4. MR. MAJOR

381. Experimental Physiology—Advanced laboratory and surgical procedures. Last half of course will be devoted to a class project, the entire group functioning as a research team. Prerequisite: consent of instructor. *Lab* 4, *Cr* 3. MR. MAJOR

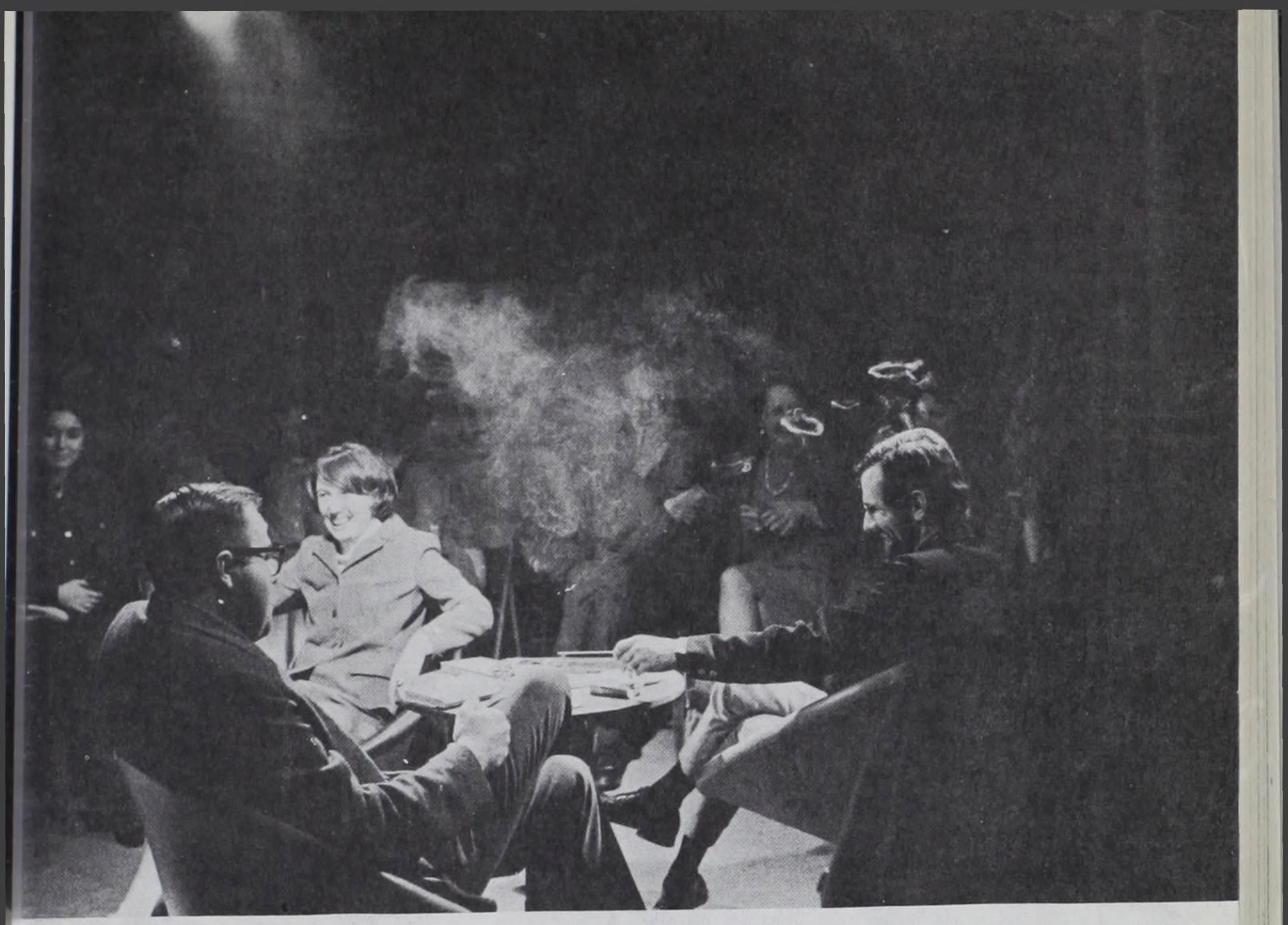
384. Advanced Cell Physiology—Seminar in current topics in cellular and molecular biology including modern methods of investigation. Prerequisite: consent of instructor. *Lec* 2, *Cr* 2. MR. COOK

385. Comparative Endocrinology—This course is concerned with endocrine mechanisms in lower vertebrates and invertebrates. The comparative physiological and comparative biochemical approach is emphasized through lecture and laboratory demonstration. Prerequisite: year of physiology. *Lec* 3, *Cr* 3. MR. VALLEAU

391. 392. Problems in Zoology—*Cr Ar.* STAFF

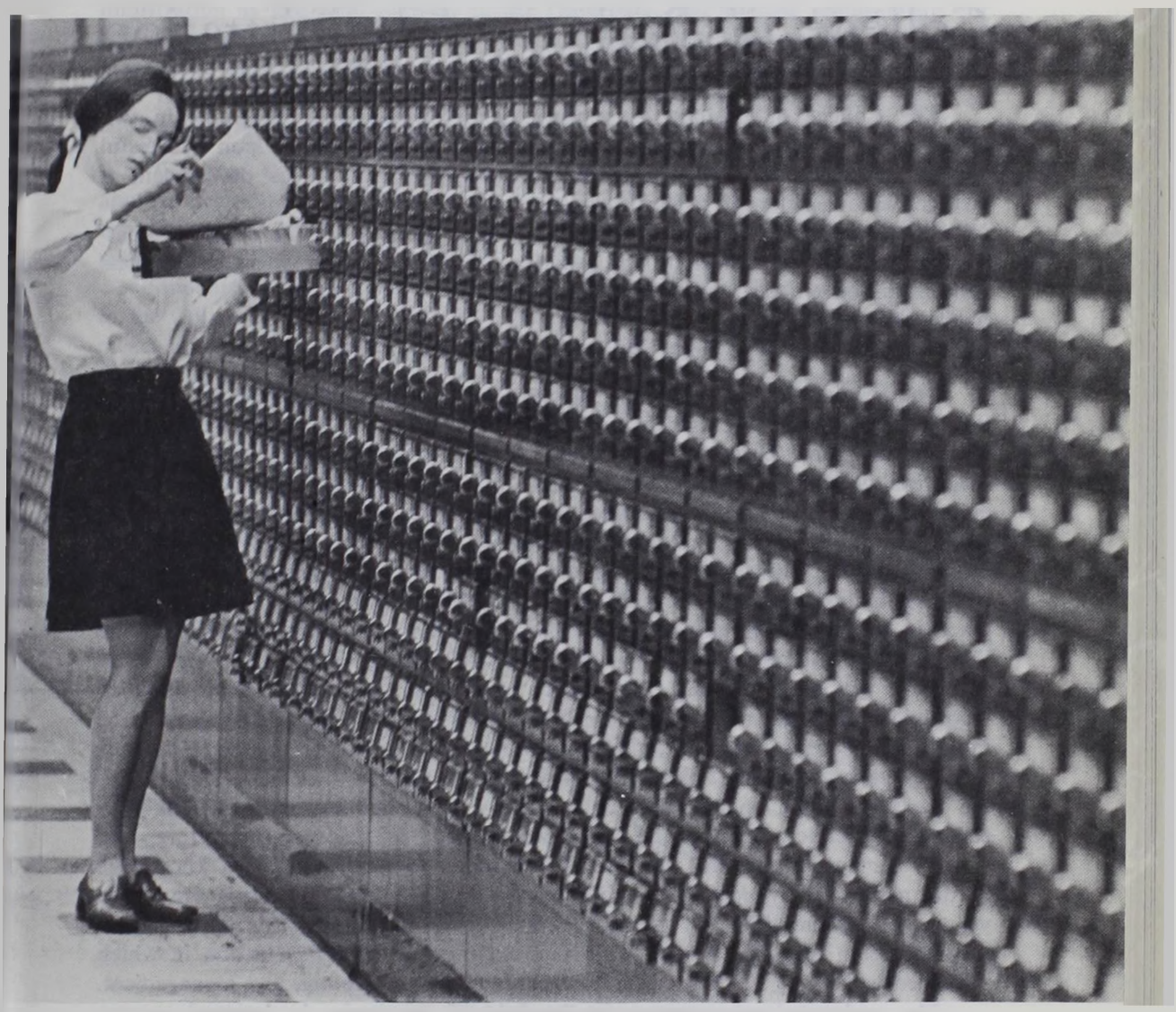
393. 394. Problems in Biological Oceanography—To be given fall, spring, or summer at Orono or The Darling Center. *Cr Ar.* STAFF

399. Graduate Thesis—*Cr Ar.* STAFF



COLLEGE OF BUSINESS ADMINISTRATION

W. STANLEY DEVINO, DEAN



College of Business Administration

The College of Business Administration offers four-year programs in two major areas of study: business administration and economics. Upon successful completion of the prescribed curriculum in one of these fields the student is awarded the bachelor of science degree.

The college also provides a graduate program leading to the degree of master of business administration. The graduate offerings of the College of Business Administration are described in the Graduate School Catalog.

UNDERGRADUATE PROGRAMS

The primary objective of the undergraduate program in business administration is to develop the student's abilities to assume the responsibilities of business management. The program is aimed at providing the broad training necessary for successful business management in a rapidly changing economy. No attempt is made to provide detailed specialized training in particular business tasks. The program aims, rather, at developing skills and attitudes of mind that will enable the student to cope successfully with the changing problems of business management in the years ahead. Implementation of this program takes place in three general phases: First, the student acquires broad training in the liberal arts and sciences for the necessary foundation upon which his future education will build. Second, the student pursues a program of study designed to provide him with an understanding of the major functional areas common to most business operations and with a knowledge of certain fields which are particularly relevant to the study of business management. This is referred to as the "core" program and includes basic courses in accounting, business data processing, economics, finance, the legal environment of business, marketing, and general management. Third, the student undertakes to acquire a deeper knowledge of the major field which he has selected. This is done largely during the senior year and is accomplished by taking 15 credit hours of work beyond the introductory course in the chosen field. The four major fields of concentration in which advanced work may be done are accounting, finance, marketing, and management.

The undergraduate program in the field of economics is designed to prepare students broadly for careers in the civil service, law, management, public affairs, labor relations, and for general citizenship. Economics is a social science

and as such must be studied in the perspective of a broad training in the liberal arts and sciences. Many students who plan to attend graduate and professional schools will find the undergraduate economics program to be valuable training for advanced academic work. Within the field of economics, courses are available in such fields as: price and value theory, money and banking, income and employment theory, history of economic thought, international trade and finance, labor and industrial relations, comparative economic systems, public finance and taxation, econometrics and the social control of business.

GENERAL INFORMATION

Admission—Students are usually admitted to the College of Business Administration as first-year students in the University. The specific requirements for admission are given on page 44 of this catalog. All deficiencies in entrance requirements must be removed before registering for the sophomore year. Students who transfer from other colleges with advanced standing must satisfy all basic entrance requirements within one year.

Transfer Credit — No transfer credit is granted for courses completed at another accredited institution in which grades below C have been received. Responsibility for evaluating course work for which transfer credit is requested rests with the Director of Admissions and the Dean of the College.

Students in other colleges of the University of Maine who wish to transfer to the College of Business Administration must present an academic record which meets at least the minimum standards of quality established by the University. Also, they are required to complete at least one full year of academic work as students in the College of Business Administration.

Graduation Requirements—Completion of the required work of the College of Business Administration leads to the degree of bachelor of science. All students are required to complete 120 degree hours, exclusive of credit for basic military training.

In addition, each student must accumulate a total of "grade points" equal to 1.8 times the number of credit hours in which he receives grades. This grade point average is computed by multiplying each credit hour of the letter grade by a factor in the following manner: A hours by 4, B hours by 3, C hours by 2, D hours by 1, and E hours by 0.

All course work taken in Business (Ba) and Economics (Ec) must be completed with a 2.0 (C) average for a student to be eligible for a degree.

The required course work for the B.S. in Business Administration and the B.S. in Economics are given below:

I. B.S. IN BUSINESS ADMINISTRATION PROGRAM

A. General Foundation Subjects - 48 credits

1. Humanities and Fine Arts (21 credits)

Eh 1—Freshman Composition
Eh 17—Advanced Professional Writing
Sh 1—Introduction to Oral Communication
At least three of the remaining 12 credit hours must have

an Eh designation. The remainder may be selected in such fields as: art, the classics, English composition, foreign languages, journalism, literature, music, philosophy, speech, and the theatre. Strongly recommended is: Pl 1.2 - Philosophy and Modern Life.

2. Social Science (15 credits)

This requirement may be fulfilled by course work in such fields as anthropology, government, history, modern society, psychology, and sociology. No course work in economics may be used to fulfill any part of this requirement.

3. Mathematics and Sciences (12 credits)

Ms 5/6—Elements of College Mathematics
Ms 19—Principles of Statistical Inference
The remaining credits required may be taken in an advanced mathematics course or in a science such as astronomy, biology, botany, chemistry, geology, physics, and zoology.

B. Core requirements in Business and Economics - 33 credits

Ec 1/2—Principles of Economics
Ec 168—Social Control of Business
Ba 9 —Principles of Accounting I
Ba 10 —Principles of Accounting II
Ba 23 —Elements of Industrial Management
Ba 63 —Marketing
Ba 130—The Legal Environment of Business
Ba 147—Business Data Processing*
Ba 149—Business Economics
Ba 151—Business Finance

* Ms 169 or another computer course may be substituted for Ba 147. In that event, the student must complete three additional hours in a Ba elective.

C. Major Field - 15 credits

Accounting Major
Ba 41/42—Intermediate Accounting
Ba 143—Advanced Accounting
Ba 145—Cost Accounting I
Ba 148—Auditing

Marketing Major
Ba 159—Business Management and Policy
Ba 165—Advertising
Ba 167—Sales Management
Ba 169—Marketing Research
Ba 170—Managerial Marketing

Finance Major
Ba 41 —Intermediate Accounting
Ba 156—Investment Strategy
Ba 157—Forward Planning and Capital Decisions
Ba 158—Corporate Treasury Dynamics
Ec 153—Money and Banking

Management Major
Ba 159/160—Business Management and Policy
Ba 161—Personnel Management
Ba 162—Industrial Relations
Ec 133—Labor Economics

D. Electives - 24 credits

II. B.S. IN ECONOMICS PROGRAM

A. General Foundation Subjects

1. Humanities and Fine Arts
   Eh 1—Freshman Composition
   Sh 1—Introduction to Oral Communication
   A minimum of nine additional credit hours must be taken in a field(s) such as art, the classics, English composition, journalism, literature, music, philosophy, speech, and the theatre; at least three of these nine credit hours must have an Eh designation.

2. Social Sciences
   Students must select at least 12 credit hours, including one full-year course, from the following list:
   Ay 1/2—Introduction to Anthropology
   Hy 3.4—United States History*
   Hy 5.6—History of Western Europe*
   My 1/2—Modern Society
   Pol 1/2—Introduction to Government
   Py 1/2—General Psychology
   Sy 3/4—Introduction to Sociology

   *Students may not select more than six hours of history to fulfill the 12-hour minimal requirement.

3. Laboratory Science
   Students must select at least one full-year course in a scientific field such as astronomy, biology, botany, chemistry, geology, physics, and zoology.

4. Mathematics or Foreign Language
   This requirement must be fulfilled by completion of an intermediate course in a foreign language (e.g., Fr 3/4 - Intermediate French) or completion of Ms 5/6 - Elements of College Mathematics.

5. Ms 19—Principles of Statistical Inference

B. Course Requirements in Economics and Business

1. Core Requirements:
   Ec 1/2—Principles of Economics
   Ec 132—Business Cycles
   Ec 173—Economic Analysis
   Ba 9 —Principles of Accounting I

2. Completion of at least 18 additional hours in economics (Ec) courses. However, no student will be granted degree credit for course work in business and economics in excess of 48 hours.

THE FRESHMAN YEAR

Students admitted to a degree program in the College of Business Administration should pursue the following program during the freshman year:

FALL SEMESTER				SPRING SEMESTER			
		Subject	Hours			Subject	Hours
Ec	1	Principles of Economics	3	Ec	2	Principles of Economics	3
Eh	1	Freshman Composition	3	*Ms	6	Elements of College Mathematics	3
*Ms	5	Elements of College Mathematics	3	Sh	1	Introduction to Oral Communication	3
		Social Science Elective	3			English Elective	3
		Humanities Elective	3			Social Science Elective	3
Pe	1	Physical Education	0	Pe	2	Physical Education	0
			15				15

* Business Administration majors are required to take Ms 5 and 6. Students planning to major in Economics in the College of Business Administration may elect to substitute a foreign language in place of mathematics.

COURSES OF INSTRUCTION

PROFESSORS ALMOND, DEVINO, JENSEN, JOHNSON; ASSOCIATE PROFESSORS ALPANDER, BARTLETT, FORSGREN, GOODMAN,* AND MCCLURE; ASSISTANT PROFESSORS BURNHAM, KAKALIK, SANDS,** VANGERMEERSCH, WEBSTER, AND ZIEGENBEIN; INSTRUCTORS (PART-TIME) COHEN AND WAGNER; GRADUATE ASSISTANTS RENO AND SMITH

Courses numbered 1 to 99 are undergraduate courses. They are open to graduate students but credit earned in these courses may not be used to satisfy advanced degree requirements. Courses numbered 100 to 199 are upperclass undergraduate courses which may be used by the graduate student's advisory committee. Courses numbered 200 to 299 are graduate courses which may be elected by undergraduate honor students, or those undergraduates whose advancement in the field will permit their taking a graduate level course among graduate students without disadvantage to themselves. Courses numbered 300 to 399 are graduate level courses which may be taken only by students admitted to the Graduate School.

* On leave of absence, spring 1970.
** On leave of absence 1969-70

One number is used for a course which is given both the fall and spring.

When a dash is used between the two numbers (e.g., 1-2), both semesters must be taken to obtain credit; when a slant is used (e.g., 1/2), the first semester may be taken by itself, but the second semester cannot be taken unless the first is taken previously; when a period is used (e.g., 1.2), either semester may be taken for credit.

Courses offered in 1970-71 and alternate years are indicated by the sign (†) placed before the number of the course; courses offered in 1969-70 and alternate years are indicated by the sign (‡) placed before the number of the course.

Courses in Business Administration (Ba)

9. Principles of Accounting I—An introductory course in accounting with emphasis on the basic accounting cycle, management use of accounting data, construction and analysis of financial statements, asset valuation, and elementary cost analysis. *Cr* 3. STAFF

10. Principles of Accounting II—Books of original entry, analysis of assets and liabilities, negotiable instruments, and an introduction to partnership and corporate accounting. Prerequisite: Ba 9. *Cr* 3. STAFF

23. Elements of Industrial Management—A comprehensive survey of all phases of the management of industrial and business enterprises. The influence of industrial relations is interspersed with the treatment of management's technical problems. Prerequisite: Ec 1/2. *Cr* 3. MR. ALPANDER

41/42. Intermediate Accounting—Principles regarding the valuation and recording of working capital items and noncurrent items; capital stock and surplus; statement analysis. Prerequisite: Ba 9, 10. *Cr* 3. MR. VANGERMEERSCH

63. Marketing—Problems of distribution for representative industrial and consumer goods, including merchandising policies, selection of distribution channels, price policies, and advertising and sales promotion methods. Prerequisite: Ba 9, Ec 1/2. *Cr* 3. MR. ALMOND

76. Federal Tax Reporting—Federal tax laws as they affect individuals, partnerships, corporations, and estates. An opportunity is given the student to become familiar with tax forms. Prerequisite: Ba 9, 10. *Cr* 3.

90. Problems of Small Business — A consideration of those aspects of management that are uniquely important to small firms, in the interest of developing an understanding of the economic and social environment in which the small concern functions. Course will afford the student practice in decision-making on the same types of problems that small businessmen face. Directed toward students who wish to explore opportunities for operating their own small businesses, and to those who expect to have small businesses as customers or suppliers. Problems relevant to small business operations in Maine will be stressed. Prerequisite: Ba 9. MR. ALMOND

125. Business Logistics—An introduction to the elements of the logistical system includes consideration of transportation modes, plant and warehouse location, inventory size determination, etc. Cases and problems are utilized to sharpen analytical techniques. Final attention turns to the total cost approach to logistical system analysis and decision-making. Prerequisite: Ba 23, 63. *Cr* 3 MR. KAKALIK

130. The Legal Environment of Business—An examination of fundamental legal concepts and their application to the business community. Among

the topics discussed are the evolution of law and its underlying conceptual framework from which legal rules and principles of business develop. Selected legal cases will be critically analyzed and discussed. (Juniors and seniors only). *Cr* 3.

143. Advanced Accounting I — Principles, theory, and procedures of parent and subsidiary accounting. A comprehensive study of consolidated statements, affiliation structures, and consolidations and mergers. Also includes home office and branch accounting. Prerequisite: Ba 41/42. *Cr* 3. MR. MCCLURE

144. Advanced Accounting II — The application of accounting principles to accounting problems arising in connection with: partnerships, joint ventures, insurance, consignments, installment sales, statement of affairs, receiverships, estates and trusts, statement of realization and liquidation, foreign exchange, and governmental and institutional accounting. Prerequisite: Ba 41/42. *Cr* 3.
MR. MCCLURE

145. Cost Accounting I—The principles and methods of job order costs, including inventory control and pricing, labor and analysis and allocation of factory overhead. Principles and practices of process cost accounting. Prerequisite: Ba 9, 10. *Cr* 3. MRS. GOODMAN

146. Cost Accounting II—A comprehensive study of joint and by-product costs, estimated and standard costs, distribution and differential costs. Budgeting. Analysis of cost structure and management use of standards. Prerequisite: Ba 145. *Cr* 3. MRS. GOODMAN

147. Business Data Processing—The application of electronic data processing equipment to accounting systems. Basic principles of operation and programming. Selected case problems. Prerequisite: Ba 9. *Cr* 3. MR. JENSEN

148. Auditing—The systematic verification of financial statements including a study of the responsibilities, liabilities and ethics of the independent public accountant. Prerequisite: Ba 9, 10, 41. *Cr* 3. STAFF

149. Business Economics—Application of economic analysis to concrete business situations. Emphasis on developing the student's ability to apply economic analysis to the solution of problems faced by business management. Prerequisite: Ec 1/2, Ba 9. MR. BURNHAM

150. Financial Institutions—A survey of the operations and economic roles of financial institutions: commercial banks, investment houses, and investment markets; savings and insurance institutions; and governmental agencies. An institutional introduction to the fields of private and public finance. Prerequisite: Ec 1/2 or permission. *Cr* 3. MR. WEBSTER

151. Business Finance—This course deals with the promotion, organization, and financing of the single proprietorship, partnership, and corporation. It also utilizes advanced cases and problems related to the above topics. Prerequisite: Ec 1/2, Ba 9. *Cr* 3. MR. ZIEGENBEIN

156. Investment Strategy—Emphasis is on analysis and selection of stocks and bonds as part of the investor's approach to financial security. The relationships between the securities markets, the total money market and the general economy are examined. Prerequisite: Ba 151. *Cr* 3. MR. WEBSTER

157. Forward Planning and Capital Decisions—Basic financial forecasting and risk evaluation are combined with profit-volume-cost analysis as essentials in fully evaluating capital expenditure proposals. Cost of capital and other tools are developed for use in the decision-making process. Prerequisite: Ba 151. *Cr* 3.
MR. ZIEGENBEIN

158. Corporate Treasury Dynamics—The counterflows of cash between the corporate unit and the money market due to seasonal, cyclical, and secular demands are first analyzed. Numerous approaches to debt limit determination are then presented. The student finally turns to the total problem of making optimal financing decisions in specific corporate settings. Prerequisite: Ba 151. *Cr* 3.

MR. ZIEGENBEIN

159/160. Business Management and Policy — Administrative practice at the higher levels of business management through case analysis and discussion. The course attempts to coordinate the background of business majors in the formulation and administration of sound business policy. Prerequisite: Ec 1/2; Ba 23, 63, 149, 151. MR. BURNHAM

161. Personnel Management—The selection, training, and management of personnel in private and public business. Designed for the student interested in administration, office management, or personnel work in education, business engineering, public service, and other fields. Prerequisite: Ec 1/2. *Cr* 3.

MR. FORSGREN

162. Industrial Relations—A study of industrial relations patterns in the U.S. Major focus is on the relationship between management and organized labor, and the bargaining, administration and interpretation of contracts. The problem of disputes settlement and a comparison of methods used in the U.S. and abroad. Attention is also given to industrial relations in unorganized firms and in the civil service. Prerequisite: Ec 133. *Cr* 3. MR. ALPANDER

164. Dynamics of Organizations and Behavior—An analysis of business organization and the problems of administrators in an interpersonal setting. Primary emphasis is on the findings of behavioral sciences which are particularly relevant to the management of economic enterprises. Also an examination of interdisciplinary approaches to human relations and adjustment problems in modern organizations. Motivation, leadership, and organization theory as related to work and productivity, and associated topics are also covered. Prerequisite: Ba 23 *Cr* 3.

MR. ALPANDER

165. Advertising—The place of advertising in the marketing program. Business cases are analyzed to determine those situations in which advertising may be profitably employed to stimulate primary and selective demand for industrial and consumer goods and services. Prerequisite: Ba 63. *Cr* 3. MR. BARTLETT

167. Sales Management — An analysis of the problems facing marketing management in formulating sales policy and in managing the sales organization. Prerequisite: Ba 63. *Cr* 3. MR. ALMOND

169. Marketing Research—A consideration of marketing research as a tool in solving problems of production and distribution. Emphasis is upon problem formulation, exploratory research, research design, basic observational and sampling requirements, data analysis, interpretation, and sampling. Prerequisite: Ba 63 and Ms 19. MR. KAKALIK

170. Managerial Marketing--A managerial approach emphasizing the integration of marketing, as an organic activity, with other activities of the business firm. Study is directed toward recognition and appreciation of the problems encountered by top marketing executives in modern business, with a consideration of the policies and procedures that may be followed in their solution. By case analysis and consideration of current marketing literature, students are provided

opportunities for development of abilities in solving marketing management problems. Prerequisite: Ba 63 and Ms 19. MR. ALMOND

195. Financial Research Seminar — Techniques of research and analysis are introduced and applied to topical areas in finance, such as money, credit, banking and debt instruments. Prerequisites: Ba 151, Ec 153, Ms 19 and permission. *Cr* 3. MR. JOHNSON

310. Management Policy—Administrative practice at the higher levels of business management. Coordinates the analysis of all pertinent business functions in specific case studies for the purpose of developing administrative competence in the formulation of business policy at the decision-making level. Prerequisite: 6 hours in business subject and permsision. *Cr* 3. MR. BURNHAM

311. Managerial Economics — Application of economic analysis to the management of business enterprises. Designed to develop the student's ability to understand and use some of the important economic concepts, tools, and methods, relevant to operations and decisions within a business firm. Particular attention is given to the analysis of market demands, price policy, cost structures and production functions, capital budgeting, planning, and financing. Prerequisite: 9 semester hours in economics or permission. *Cr* 3. MR. WEBSTER

312. Managerial Accounting — Development, analysis, and interpretation of accounting data and financial statements for managerial control, coordination, and decision-making; emphasis upon accounting as a tool of management. Topics are developed by utilization of case studies, problems, and reference material. Prerequisite: 6 semester hours in accounting. *Cr* 3. MR. MCCLURE

313. Business Cycles and Forecasting—An examination of cyclical movements in the level of economic activity and appropriate methods for their measurement. Includes an analysis of the principal theories of the forces that shape these fluctuations. Relates the statistical methods of forecasting activity in the major economic sectors to the planning function of management. Prerequisite: 6 semester hours in economics. *Cr* 3. MR. JOHNSON

314. Financial Management—A consideration of management decisions in the administration of corporate funds. Specific areas covered include capital budgeting, inventory control, working capital management, and the cost of capital. The side effects of taxation, depreciation methods, and earnings retention policies are noted. Current capital structure patterns are analyzed and evaluated. Prerequisite: one course in finance and permission. *Cr* 3. MR. ZIEGENBEIN

315. Marketing Management—This course is concerned with developing an ability to analyze marketing problems while acquiring a positive attitude as to the role that marketing plays in overall business strategy. Emphasis will be given to the building of integrated marketing programs designed to implement the long-term objectives of a business organization. In general, the viewpoint emphasized will be that of the high level marketing executive. Prerequisite: one course in marketing and permission. *Cr* 3. MR. ALMOND

316. Industrial Relations and Personnel Management—A comprehensive investigation of the changing pattern of industrial relations in the United States. Major emphasis is on the human, social, and economic aspects of employer—employee relationship in both union and non-union settings. Provides an understanding of and appreciation for the crucial importance of the development of sound and flexible personnel policies by top management. Among the areas considered are: the changing nature of the labor force; wages, salaries and fringe

benefits; hours of work; and the impact of technological change on the work force. Prerequisite: one course in management or industrial relations and permission. *Cr* 3. MR. ALPANDER

320. Market Research and Analysis—A study of the procedures and applications of market research. Such areas as the organization and operation of a research department, survey methods, experimentation, measurement of potential demand, and the analysis of distribution costs are considered. Emphasis will be placed on developing the student's ability to apply these and other techniques toward the solution of marketing problems. Prerequisite: Ba 315 and one course in statistics. *Cr* 3. MR. KAKALIK

321. Human Relations in Industry—This course is designed to acquaint the student with the complex system of interdependent human, social, technical, and organizational forces which underlie the feelings, actions, and relationships of people in organizations. Such subjects as leadership theory, organizational theory, individual and group behavior, and communication theory are presented. Prerequisite: 6 hours in business subjects and permission. *Cr* 3. MR. ALPANDER

322. Operations Research—This course deals with the formulation and solution of optimization models for business decision making and economic resource allocation. Major emphasis is placed upon mathematical programming models, including linear programming fundamentals, simplex method, duality theory, sensitivity analysis and parametric programming in post-optimality analysis, goal programming, linear programming under uncertainty, dynamic programming, allocation problems (assignment, transportation models, transportation simplex methods), network flows, integer programming, nonlinear programming, polygonal approximations, and gradient methods. Emphasis is placed upon applications in accounting, finance, economics, marketing, and production management. Prerequisite: one course in statistics and permission. *Cr* 3. MR. JENSEN

323. Production Management—Decision models will be introduced with emphasis on statistical inference and decision theory, queueing theory, inventory theory, simulation, game theory, and Markovian decision models. Application areas include Product R & D investment models, capacity investment decision models, facility design models, line-balancing models, system maintenance models, and production system operating models. Prerequisite: Ba 322 or permission of instructor. MR. JENSEN

324. Investment Management—Emphasizes analysis and valuation procedures required to determine the investment quality of specific securities. Sets forth criteria for the formulation of a sound investment policy and the selection of investment media to implement it. Develops the techniques of continuing portfolio management and the task of periodic reappraisal. Prerequisite: one course in finance and permission. *Cr* 3. MR. WEBSTER

325. Collective Bargaining—Discusses the major issues and problems in the collective bargaining process. Provides the business manager with the knowledge of sound collective bargaining attitudes and techniques necessary to achieve a responsible and mature attitude in his relationship with employee representatives. To this end, major focus is on the development of the union movement in this country, the changing nature of public policy toward collective bargaining and the public responsibility of both unions and management. In addition, attention is given to the specific tools of collective bargaining, including strikes, lock-

outs, grievance procedures, arbitration, mediation, and bargaining strategies and techniques. Prerequisite: Ba 316. *Cr* 3. MR. DEVINO

326. Organizational Behavior in Business—Behavior in work organizations is studied with emphasis on the importance of the influence process, motivational settings, and the structural backgrounds of organizational status and social relations. Analysis through case discussion and readings will develop a conceptual framework for improving individual decision-making ability with respect to individual, group, and intergroup problems. Prerequisite: one course in management and permission. *Cr* 3. MR. FORSGREN

368. 369. Manpower Research Seminar—An examination of the economic, social, and psychological factors affecting manpower development and utilization. This interdisciplinary seminar is part of the University's manpower research project. It gives students a unique opportunity to participate in current research, from problem formulation to data collection and analysis. By permission.

MR. FORSGREN

Course offerings in economics are described under College of Arts and Sciences.

Corporate
(B.D.C.) Community

COLLEGE OF EDUCATION

MARK R. SHIBLES, DEAN

College of Education

The College of Education offers four-year programs designed to prepare elementary, junior and senior high school teachers and teachers of physical education, athletics, health recreation, music and art. Within the four-year undergraduate program a student may start his preparation for such positions as a specialist in reading, guidance counselor, principal, supervisor, and school administrator. These programs are usually completed during a period of graduate study.

The College of Education also provides instruction, on a service basis, in the professional subjects essential to the preparation for teaching, to undergraduate students from other divisions of the University, and also for students registered with the Faculty of Graduate Study.

GENERAL INFORMATION

The College of Education concerns itself only with those students who are planning for a career in the field of education. All of its undergraduate programs are designed so that each student will include a substantial amount of college work in the humanities, a concentration of academic work closely related to the area of special teaching interest, and basic professional work in education and psychology. No undergraduate student in the College of Education will be recommended for a degree until he has fulfilled these requirements.

ADMISSION

Students ordinarily are admitted to the College of Education as first-year students in the four-year program. The specific admission requirements are given on page 45 of this catalog. Any deficiencies in these requirements must be made up during the student's first two years. A student admitted with advanced standing must satisfy all basic entrance requirements during his first year in the College of Education.

DESCRIPTION OF THE FOUR-YEAR PROGRAM

The booklet, "Four-Year Programs in the College of Education," describing in detail the special requirements in general education, the courses needed for the development of various teaching fields, and the required work in professional education, has been prepared for students who desire to enter education.

A copy of this booklet may be obtained by writing to the Director of Admissions or the Dean of the College of Education.

ADMISSION WITH ADVANCED STANDING

Students from other institutions who have already completed a portion of college work, or who desire to change their professional plans and enter education, are invited to apply for admission by transfer. Each case will be considered on its own merits. When such students are accepted, they will be given advanced standing in the College of Education for work already completed which meets the established standards of quality and the specific course requirements of the program to which they are seeking admission.

Summer Session and Continuing Education Students—Students whose only work in the College of Education has been or will be in the Summer Session or Continuing Education Division program are strongly urged to apply for admission to the University exactly as they would if they expected to apply for resident work during the regular school year. This recommendation applies both to students who expect to work for a degree in the various colleges of the University and also those who have not yet fully decided on the matter.

Among the advantages of being admitted to the University are: immediate assignment of a major adviser to counsel on registration, requirements, etc.; and eligibility for guidance and counseling service. Students who expect their work to be in the Summer Session should apply before their first registration; students whose first work is to be by continuing education class should apply during their first course.

Application for admission should be made directly to the Director of Admissions, University of Maine. (See sections immediately above.)

GRADUATION REQUIREMENTS

The completion of the required work of the College of Education leads to the degree of bachelor of science in education (B.S. in Ed.).

A total of 120 degree hours of required college work, exclusive of credit for basic military training (if elected), is required for graduation. In addition, each student must accumulate a total number of "grade points" equal to twice the number of hours in which he receives grades. Grade points are computed by multiplying each hour of the letter grade by the factor as follows: A by 4, B by 3, C by 2, and D by 1.

Included in the 120 semester hours required for graduation for those who follow the *elementary teacher* program are a minimum of 55 degree hours in general education, 30 degree hours of courses in professional subjects, 7 hours of course work offered by affiliated departments, and 24 hours in an academic field of concentration. Special work in appropriate fields (such as art, music and health and physical education) also is required.

All courses taken in the student's academic teaching field and in his professional work must be completed with a 2.0 (C) average to be eligible for a degree. In addition, a student must likewise acquire a 2.0 (C) average in all work taken before the degree may be awarded.

Those who follow the *secondary teacher* program are required to complete a minimum of 50 degree hours in general education, 18 degree hours in professional education, and 51 to 58 degree hours in the field of concentration (depending upon field of concentration), plus electives.

Students who expect to qualify to teach in a *specialized field*, such as physical education, music education, or art education, will use the work in these special areas as their field of concentration. In addition, students who follow the physical education program will be required to complete a 30-hour academic teaching major. Those who follow the music or art education program are required to complete no less than a 24-hour academic specialization.

Students who follow the *elementary teacher* program are required to complete a 24-hour academic specialization in addition to other specialized subjects such as music and art. Details will be found in the folder outlining the complete program, which may be obtained by writing to the Dean of the College of Education.

General Education Subjects Required—Information concerning the specific courses required in general education is available from the Office of the Dean. The subjects are:

English
Speech
Social Studies
Science
General Psychology
Cultural Perspectives
Man and His Environment
Educational Sociology
Electives in the above areas to total 50 credit hours

In addition to their regular subjects, teachers generally participate in the direction of student activities such as music, debating, dramatics clubs, and games. Each student in the College of Education should develop some proficiency in at least one of these fields.

Professional Subjects Required—The professional subjects required for a degree from the College of Education also meet the current state requirements for a teaching certificate. Students who desire to qualify for general teaching in the junior and senior high school only are required to complete 18 credit hours in professional education in addition to courses in general psychology. Students who desire to qualify for general teaching in the elemnetary school are required to complete 30 credit hours in professional education and 7 hours of course work offered by affiliated departments plus general psychology.

The required professional subjects are designed to acquaint the student with the general aims of education and the techniques and principles of teaching. These courses are arranged so that they culminate in the course Observation and Supervised Student Teaching. There are two student-teaching plans. In one, the student spends a half-day for one semester in regular college work and the other half-day as a student teacher in a local school; under the second plan, the student spends full days in regular college work for one half of the semester, and full days as a student teacher in the public schools for the other half semester.

RESIDENCE REQUIREMENTS

A minimum of 30 semester hours of credit must be earned as a student in the College of Education to qualify a candidate for a degree. This requirement may be met by one academic year of residence, or by attending Summer Sessions; however, regularly enrolled students in the University who wish to transfer to the college may be expected to complete two full years, or the equivalent, to meet degree requirements. For students enrolled in Continuing Education Division and Summer Session courses, the 30 hours of residence credit may be obtained over an extended period of time and need not be continuous; however, such candidates must enroll for the last six hours of credit on the campus. Work taken in the C.E.D. is considered resident credit for undergraduate students in the College of Education. Off-campus students, before enrolling for a course, should ascertain from the Dean of the College of Education the amount of such work that is allowed toward fulfilling the requirements for the degree.

Exceptions to these rules will not be permitted except by a vote of the faculty.

EDUCATION COURSES IN THE SUMMER SESSION AND BY EXTENSION IN THE CONTINUING EDUCATION PROGRAM

Numerous education courses are offered during the Summer Session and by class extension through the Continuing Education Division. Detailed information regarding the Summer Session may be obtained by communicating with the director, Mark R. Shibles, College of Education, Orono, Maine 04473. Information concerning extension programs in the C.E.D. program may be obtained by writing John M. Blake, Director C.E.D. Division, University of Maine, Orono, Maine 04473.

BUREAU OF EDUCATIONAL RESEARCH AND SERVICE

Organized as an integral part of the College of Education, the Bureau of Educational Research and Service offers specialized service in connection with testing programs, surveys, and counseling on campus and to the schools of the state. Information concerning these services, including appointments and fees, may be obtained from the director.

In addition to being available for consultation on special problems, the bureau maintains the regular services listed below.

Testing Service on the University Campus—An IBM test scoring machine is available for campus use with either standardized or informal tests. Sample tests and catalogs of test publishers are available for study by the University faculty. Answer sheets, scoring keys, special pencils, and other materials, as well as information booklets on the construction of informal tests for machine scoring, are carried in stock.

Scoring and reporting the results of freshman placement tests also are carried on by the bureau.

Testing Service Off-Campus — The bureau is available for consultation with school officials of the state in planning testing programs. Arrangements may be made for scoring tests used in such programs. Basic materials for use with the IBM scoring machine can be rented from the bureau.

AUDIO-VISUAL CENTER

The Audio-Visual Center, under the auspices of the College of Education,

maintains a rental library of educational motion pictures, and assists in their selection and use. These materials and services are available to Maine schools, civic groups, student organizations, and campus classes at the University.

A small rental or service fee is charged for these materials when they are sent off campus; no fee is charged for the educational use on the campus. In addition, projection equipment and a staff of student operators are available for campus use. A projection room is provided in the College of Education Building for use when suitable classroom space is unavailable.

To assist in the selection and use of audio-visual teaching aids, interested persons are invited to inspect these materials, catalogs and descriptive publications of the manufacturers. The office will be glad to arrange previews of any of its material.

Details of this service are contained in a separate bulletin which is available on request. For this bulletin, or other information, address the office of the Director of Audio-Visual Center, College of Education Building.

THE HONORS PROGRAM

With the cooperation of the other divisions, the College of Education participates in the University Honors Program. Twice during their freshman year, students of high academic standing and exceptional promise are considered for enrollment in honors courses. Students who do not enter the program during the spring semester of their freshman year may, if qualified, be selected to begin honors study the following fall. Although as a rule students are invited to become candidates for the program by a selection committee, a student himself may initiate his candidacy by requesting a written endorsement from his academic adviser addressed to the committee. Information about this program may be obtained from Prof. G. T. Davis, 132 Education Building.

A more detailed statement of the University Honors Program begins on page 114 of this catalog. Honors (Hr) courses are as follows:

41. Distinguished Freshman Seminar — Limited to Distinguished Maine Students and to a limited number of other students, by invitation. Discussions and demonstrations displaying the range and nature and the Liberal Arts and Sciences. *Cr* 3. MR. SIMPSON, Chairman

45. Honors Colloquium—Readings and discussions on the basic concepts of Western civilization. *Cr* 3.

47. 48. Honors Group Tutorial—Oral and written reports under tutorial direction, upon a planned sequence of books representative of the various fields of liberal education. Hr 47.48 fulfills the sophomore humanities requirement for those students interested in the Honors Program. *Cr* 3. MR. THOMSON, Chairman

51. 52. Honors: Specialized Studies—A tutorially conducted survey of the student's major field, issuing in the choice of an approved thesis topic. *Cr* 3.

53. 54. Honors Thesis—The planning and completion of an honors thesis or research project. *Cr* 3.

TEACHER EDUCATION PROGRAM

Teacher education is a function and responsibility of the entire University. A Universitywide Advisory Council on Education oversees the admission of students to the Teacher Education Program. Regardless of a student's college or department affiliation, the student must enroll as a teacher candidate if he desires

to receive the University's approval for certification as a public school teacher. Application forms may be obtained at the Information Desk, College of Education Building. The Advisory Council screens applications submitted usually at the end of the sophomore year.

Students admitted to the University Teacher Education Program who make satisfactory records in student teaching, and who meet the graduation requirements of their college, will be recommended by the University for the provisional teaching certificate.

CERTIFICATES FOR TEACHERS

It should be clearly understood that the State Department of Education has sole authority to issue certificates for teaching. The office of the Dean of the College of Education, however, is in a position to advise prospective teachers concerning certificates.

To provide for the many types of school positions, the State Department issues several types of certificates. However, upon successful completion of his program, the undergraduate student in the College of Education will generally be eligible for the provisional teaching certificate at either the elementary or secondary school level, whichever is applicable. The graduation requirements of the College of Education are established so that all students graduated from the college will meet or exceed the requirements for the provisional certificate.

In addition to furnishing courses for its own students, the College of Education acts as a service agency to provide professional training for students from other teaching units of the University who wish to qualify for a teaching certificate. Such students are enrolled in the same classes with students from the College of Education.

Pattern A

(1) A minimum of 30 semester credit hours in a subject field together with (2) a minimum of 18 semester credit hours in a second subject field.

Pattern B

A minimum of 50 semester credit hours which may include special methods within an area of specialization (i.e., social studies, English, science and mathematics, the sciences).

Requirements for certificates in the areas of physical education, music education, and art education differ from the above. Information may be obtained at the office of the College of Education.

PLACEMENT FOR TEACHERS

The University of Maine Placement Bureau includes among its services assistance to prospective teachers in finding teaching positions and in facilitating promotion of teachers in service. Information regarding this service may be obtained from the University of Maine Placement Bureau, East Annex, University of Maine, Orono, Maine 04473.

COURSES OF INSTRUCTION

PROFESSORS CAUGHRAN, DAVIS, FREEMAN, PORTER-SHIRLEY, PRESCOTT, SANFORD, SUPPLE AND ZINK; ASSOCIATE PROFESSORS BOYCE, CHIAPPONE, DRUMMOND, GRAY, HAAS, LEPLEY, LINDLOF, LOWELL, MURO, MYERS, NICHOLS, D., ROBERTS, RYAN AND TRUBOV; ASSISTANT PROFESSORS BISHOP, BUTZOW, COBB, CROXFORD, DAVIS, W., DUPLISEA, HART, JARDINE, JOHNSON, JUDD, MILLER, SAUNDERS, THOMAS, VITRO, VROOMAN, WHITE, WHITMAN, WORK; LECTURERS FOBES, FRISBIE AND PUFFER; COOPERATING STAFF MEMBERS, CHAPMAN, ENGLISH; LEWIS, ART; NESBIT, MUSIC; WOOTTON, MATHEMATICS; O'NEIL, FOREIGN LANGUAGES

Courses numbered 1 to 99 are undergraduate courses. They are open to graduate students but credit earned in these courses may not be used to satisfy advanced degree requirements. Courses numbered 100 to 199 are upperclass graduate courses which may be used for graduate degree credit by graduate students if given prior approval by the graduate student's advisory committee. Courses numbered 200 to 299 are graduate courses which may be elected by undergraduate honor students, or those undergraduates whose advancement in the field will permit their taking a graduate level course among graduate students without disadvantage to themselves. Courses numbered 300 to 399 are graduate level courses which may be taken only by students admitted to the Graduate School.

One number is used for a course which is given both fall and spring.

When a dash is used between the two numbers (e.g., 1-2), both semesters must be taken to obtain credit; when a slant is used (e.g., 1/2), the first semester may be taken by itself, but the second semester cannot be taken unless the first is taken previously; when a period is used (e.g., 1.2), either semester may be taken for credit.

Courses offered in 1970-71 and alternate years are indicated by the sign (†) placed before the number of the course; courses offered in 1969-70 and alternate years are indicated by the sign (‡) placed before the number of the course.

The following courses may be offered during the regular academic year, through the Continuing Education Division, or the Summer Session.

Appraisal—Pupil Adjustment and Personnel Practices (Ed A)

120. Evaluating Pupil Achievement — Philosophy, principles and techniques of evaluation in the schools (K-12). Methods of measuring pupil achievement will be emphasized. Practice in the construction of teacher-made tests and the interpretation of standardized tests will be provided. Prerequisite: Ed B2 and Ed B3, or their equivalents. *Cr* 3. MR. PRESCOTT, MR. DRUMMOND

150. Guidance and the Teacher—Role of the classroom teacher in studying individual pupils and utilizing accumulative records; resources available to the teachers for help in studying individual pupils; teacher's function in homeroom activities. For either elementary or secondary school classroom teachers. This course is particularly designed for the certified classroom teacher. *Cr* 3.

MR. SANFORD, MR. MURO, MR. JOHNSON

251. Introduction to School Guidance Services—Basic graduate course for students planning to specialize in guidance. Philosophy, principles, and practices

of school guidance activities. Survey of school guidance services. May also be useful to school administrators who wish to gain a thorough understanding of a well-balanced guidance program. Prerequisite: Ed B 3 and Ed B 4 or their equivalents. *Cr* 3. MR. SANFORD, MR. MURO, MR. RYAN, MR. WORK

252. Guidance in Groups—A broad survey of the various ways guidance and student personnel specialists can work with groups to facilitate basic guidance objectives. The group will be studied as: (1) a tool to promote individual growth. (2) a dynamic process, and (3) a unit to present relevant content not otherwise readily available to group members. Each student will be a member of a laboratory group and will be asked to report to the instructor his analysis of the group from a task and process frame of reference. A group term paper permits each laboratory group to analyze at least one aspect of guidance in groups in depth. Prerequisite: Ed A 251 and Ed A 255 or their equivalents. *Cr* 3. MR. SANFORD

253. Guidance in the Elementary School — An introductory course designed to give a broad overview of the philosophy, objectives, and nature of guidance as it applies to the elementary school, and to accomplish an integration of related, concurrent studies. The counselor's relationship with teacher's school administrators, and other specialized personnel will be examined. School psychologists, social workers, and school administrators will make special presentations to underscore the team approach to elementary school guidance. Community resources for child welfare and development will be visited and studied. Students will study specialized guidance techniques for obtaining information about pupils in the elementary school. Each student will design a complete program of guidance in the elementary school based upon class presentations and a critical review of the literature. Prerequisites: Ed B 3, Ed B 4, Py 123, and Sy 3. *Cr* 3. MR. MURO

254. Introduction to Counseling the Young Child—An examination of the goals of counseling, counseling philosophy and the operational issues involved with special attention to counseling with young children. The different roles in counseling with young children among psychologists, psychiatrists, social case workers and school counselors will be studied. Students will study both verbal and non-verbal aspects of counseling and use CCTV to examine play and activity techniques. Prerequisite: Ed A 253. MR. MURO

255. Introduction to Counseling—Study of the counseling process. Methodology and philosophy of counseling with special emphasis on counselor behavior in the one-to-one counseling relationship. Particularly designed for individuals preparing to serve as counselor to well-adjusting students in educational settings. Prerequisite: Ed 251 or taken concurrently with Ed A 251. *Cr* 3.

MR. SANFORD

261. Student Personnel Services in Higher Education—A survey of the history, philosophy, and current trends in student personnel services. The interrelationships between these services as they assist the student to attain his academic potential is emphasized. *Cr* 3. Prerequisite: permission of instructor.

MR. WORK

290. Nature and Needs of the Retarded—An advanced course emphasizing the social role of the retarded built upon the prerequisites and dealing with the total range of mental retardation Correlations of the educational, social, and psychological needs of the retarded relative to degree of retardation and determination of appropriate social and vocational goals for this individual. Behavioral observations which may enhance or limit the achievement of those goals, and those

social and rehabilitative agencies also concerned with the mentally retarded. Prerequisite: Py 126, Ed M 170, and Ed C 210. *Cr* 3.

MR. CHIAPPONE, MR. WILLIAM DAVIS

320. Educational Measurement—Basic measurement theory; use of descriptive statistical techniques for pupil diagnosis and evaluation; use of tests and testing programs in school. Prerequisite: Ed B 4 or Ed 120 or equivalent. *Cr* 3.

MR. PRESCOTT, MR. DRUMMOND

321. Statistical Methods in Education—A course which presupposes and builds upon the statistics offered in Ed A 320, dealing with problems of sampling, probability, tests of significance, and correlation techniques not carried out in Ed A 320. Considerable emphasis to be placed on non-parametric statistics. Statistical techniques required by students doing research will be considered. Prerequisite: Ed A 320. *Cr* 3. MR. PRESCOTT, MR. LINDLOF, MR. DRUMMOND

351. Vocational Developmental Theory—A study of vocational behavior as it is related to personality development and social background. The course considers the relationship between life stages and career patterns, and how the concept of self is implemented and possibly changed through work experiences. Close attention is given to programs of research on vocational behavior. *Cr* 3.

MR. RYAN

352. Group Procedures in Counseling—An extension of counseling theory and practice to the group rather than the one-to-one relationship. An evaluation of small group discussions as a learning medium for personal growth of participants. Research in group counseling will be examined. The role of the counselor as he develops his relationships with groups will be given particular attention. Prerequisite: Ed A 255 or equivalent. *Cr* 3. MR. SANFORD, MR. MURO

353. Occupational and Educational Information—Sources and nature of occupational and educational information; collection, evaluation, and use of informational materials with individuals and groups. Prerequisite: Ed A 251 or equivalent. *Cr* 3. MR. RYAN

354. Organization and Administration of School Guidance Services—Planning the guidance services for a school system; budget making; staff relationships. Prerequisite: Ed A 251, Ed A 255, Ed A 320, Ed A 353 or their equivalents. *Cr* 3. MR. SANFORD, MR. RYAN

355. Advanced Counseling—Counseling theory and philosophy. A close look at various theories of counseling. Designed to follow a more basic course in counseling and some supervised practice in counseling. Prerequisite: Ed A 255, or equivalent. *Cr* 3. MR. SANFORD, MR. MURO

Basic Professional Courses (Ed B)

2. The American School—Examines the nature, role, purposes, and curriculum of elementary and secondary schools with special attention to the place and function of the teacher within this social institution. This is one of the courses prerequisite to student teaching in all regular undergraduate programs. Not open to freshmen. *Cr* 3. MR. TRUBOV, MR. VROOMAN, MR. MYERS, MR. GRAY

3. Growth-Learning Process—The pupil and his learning processes, including learning theories, pupil growth patterns, and selected techniques for the study of pupil development. This is one of the courses prerequisite to student teaching in all regular undergraduate programs. Not open to freshmen or sophomores. *Cr* 3. MR. SAUNDERS, MR. WILLIAM DAVIS, MR. VITRO

4. The Teaching Process—The procedures of instructional planning, including such items as improved use of small groups, classroom space, and appropriate teaching materials; measurements, evaluation, and reporting of pupil learning. This is one of the courses prerequisite to student teaching in all regular undergraduate programs. Not open to freshmen or sophomores. *Cr* 3.

MR. LINDLOF, MR. HART, MR. MILLER, MR. JUDD, MR. THOMAS

Curriculum and Instructional Materials (Ed C)

113. Principles of Curriculum Construction (Conservation) for Elementary School Teachers—This course is open to all elementary teachers who have completed a Conservation Education Workshop or its equivalent. The program of the Curriculum Workshop is concerned with the production of instructional materials on natural resource conservation for schools. Specifically, it provides opportunities for writing reference and reading materials for children, units of study, instructional guides, bibliographies, and for making many types of visual aids useful in teaching conservation at the various school levels. *Cr* 3.

117. Children's Literature—An overview of literature written for children between the ages of four and twelve. Emphasis will be placed on developing means of evaluating various types of books and selecting of individual children. Prerequisite: Py 1, Py 2, Ed M 13. *Cr* 3. MRS. WHITE

120. Principles of Team Teaching—The theory and practice of instructional teams. Emphasis on cooperative planning, pupil groupings, and curriculum innovation. Prerequisite: Ed B 2, Ed B 3, Ed B 4 or their equivalents. *Cr* 3.

MR. NICHOLS

123. Principles of Curriculum Construction (Conservation) for Secondary School Teachers—This course is open to all secondary teachers who have completed a Conservation Education Workshop or its equivalent. The program of the Curriculum Workshop is concerned with the production of instructional materials on natural resource conservation for schools. Specifically, it provides opportunities for writing reference and reading materials for children, units of study, instructional guides, bibliographies, and for making many types of visual aids useful in teaching conservation at the various school levels. *Cr* 3.

132. Student Activities in Secondary Schools—The place, organization and direction of student activities in the modern secondary school. Prerequisite: Ed B 2, Ed B 3, Ed B 4 or their equivalent. *Cr* 3. MR. MYERS, MR. CROXFORD

133. Instructional Media—Basic course in the improvement of learning and teaching through the effective use of instructional media and related materials. Learning principles in relation to visual communications media; nature and applications of media and instructional materials; evaluation and selection of media and instructional materials. *Cr* 3. MR. JUDD

134. Teacher-Made Instructional Material—Planning and producing inexpensive instructional materials for both elementary and secondary school subjects; selection and use of media such as posters, charts, tape, etc. *Cr* 2-3.

MR. TRUBOV

140. Studies in Physical Science—An introductory study of selected topics in physical science for elementary and junior high school teachers. Studies include mechanics, magnetism, electricity, heat, light, atoms, elements, compounds, ionization, etc. *Cr* 3. MR. BUTZOW

142. Studies in the Earth Science (Elementary)—A science content

course for elementary school teachers. Course work will involve a series of elementary laboratory and field studies in astronomy and the earth sciences of geology, meteorology and soils. Topics selected will be those that can be explored through direct observation and study. Discussions, films and library assignments will be scheduled to supplement the work in laboratory and field. *Cr* 3. MR. DAVIS

143. Field Course in the Earth Sciences (Secondary)—The studies included in this course are intended for elementary and secondary school teachers who need some introductory information in the earth sciences of geology, meteorology and soils. Where possible, the studies will be undertaken in a natural setting using equipment and materials appropriate to the learning tasks. Lectures, films and library assignments will be scheduled to supplement the field work. *Cr* 3. MR. DAVIS

144. Basic Field Ecology—This course is designed for secondary school science teachers with a broad background in the natural sciences and for qualified elementary school teachers who desire studies beyond those ordinarily included in introductory natural history courses. The course involves accumulating, interpreting and applying data acquired primarily from the natural environment. The unique facilities offered at the Bryant Pond Campus and surrounding areas make possible biotic studies ranging from the lower inland elevations to subalpine environments. This program is intended to serve the needs of teachers conducting studies in the Green Version of BSCS biology. *Cr* 3. MR. DAVIS

146. Natural Science Education — Coastal — Primarily for elementary school teachers. Field studies of plants, animals, rocks, minerals, stars and weather, with special attention to marine life of the Maine coast. Areas to be studied are selected with the needs of the elementary school teacher in mind. Lectures and library work will supplement the field studies; offered only in Summer Session, at Goose Cove, Maine. *Cr* 3.

147. Natural Science Education—Coastal—Primarily for secondary school teachers. See general description under Ed C 146. *Cr* 3.

148. Natural Science Education—Inland—Primarily for elementary school teachers. Lectures, library work and field studies in the natural history of inland Maine, with special attention to the Bryant Pond area. Such areas as general ecology, geology, weather and climate will be studied. Opportunity will be given to study various types of habitats found in Maine. This course is directed to the needs of the elementary school teacher. Given only in the Summer Session at the Freeman-Waterhouse Campus, Bryant Pond, Maine. *Cr* 3.

149. Natural Science Education—Inland—Primarily for general science and biology teachers in the secondary school. See general description under Ed C 148. *Cr* 3.

210. Planning the Curriculum for The Retarded Child—The aims and philosophy of education for the retarded child, present status of the curriculum and the factors affecting current curriculum changes. Prerequisite: Ed B 2, Ed B 3, Ed B 4 or their equivalents. *Cr* 3. MR. CHIAPPONE, MR. WILLIAM DAVIS

211. Planning the Elementary School Curriculum—Aims and philosophy of elementary education; present status of the curriculum; factors affecting curriculum changes, curriculum development and modern child psychology. Prerequisite: Ed B 2, Ed B 3, Ed B 4 or their equivalents. *Cr* 3. MR. GRAY

221. Planning the Secondary School Curriculum—Current plans of curriculum revision and reorganization with special attention to reorganization pro-

grams designed to bring the curriculum into harmony with the needs of modern life. Prerequisite: Ed B 2, Ed B 3, Ed B 4 or their equivalents. *Cr* 3.

MR. BISHOP

224. Planning the Junior High School Curriculum—Current plans of curriculum revision and reorganization of the junior high school program. Prerequisite: Ed B 2, Ed B 3, Ed B 4 or their equivalent. *Cr* 3. MR. BISHOP

233. The Dynamics of the Curriculum—The various problems and issues of curriculum development related to all areas of instruction; the nature and scope of educational experiences and opportunities essential for a vital program; the role of administration, supervision, and guidance in the improvement of instruction. Prerequisite: Ed B 2, Ed B 3, Ed B 4 or their equivalents. *Cr* 3.

236. Campus Culture and Student Activities in Higher Education—A study of the role of the student personnel administrator in relation to student government, student organizations, the development of student leadership, faculty-student relations. Prerequisite: Ed A 261 or equivalent. *Cr* 3. MISS ZINK

237. New Media in Education—Current development and utilization of new media in educational instruction. An advanced course. Prerequisite: Ed B 2, Ed B 3, Ed B 4 or their equivalents. *Cr* 3. MR. JUDD

312. Principles of Curriculum Construction (Elementary)—Designed to give supervisors, administrators and teachers a general overview of principles and methods of curriculum construction and revision; contributions of research to curriculum building, selection of content material and the development of new courses of study in the elementary school. Prerequisite: Ed C 211. *Cr* 3. MR. GRAY

322. Principles of Curriculum Construction (Secondary)—Designed to give supervisors, administrators and teachers a general overview of principles and methods of curriculum construction and revision; contributions of research to curriculum building, selection of content material and the development of new courses of study in the secondary school. Prerequisite: Ed C 211, Ed C 224, or their equivalents. *Cr* 3.

Seminars, Research and the Thesis (Ed G)

Each seminar except Ed 300 and Ed G 306 requires an appropriate course completed at the graduate level as a prerequisite.

300. Seminar: Education in the United States—This seminar is intended to provide a common background of understandings in the philosophy and issues of modern education. Another purpose is to provide experience in libray research techniques and report writing. Required of all students in the Master of Education Program. *Cr* 3. MR. HART, MR. MILLER

301. Seminar in Reading—Discussions and individual reports on problems related to better reading instruction. Prerequisite: Ed M 150 or equivalent. *Cr* 3.

MR. CAUGHRAN, MR. ROBERTS

302. Seminar in Arithmetic—Study and reports on special problems in arithmetic instruction. Prerequisite: Ed M 114, Ed M 251, or their equivalents. *Cr* 3. MRS. BOYCE

303. Seminar in Social Studies (Elementary)—Problems in the development of the curriculum, materials, resources, and methods of social studies in elementary schools. Prerequisite: Ed M 115, Ed M 215, or their equivalents. *Cr* 3. MR. SUPPLE

304. Seminar in Science (Elementary)—Problems in curriculum, materials, resources, and methods of science in the elementary school. Prerequisite: Ed M 116, Ed M 216, or their equivalents. *Cr* 3. MR. DAVIS

305. Seminar: The Retarded Child—Study of the current problems of the retarded and development of individual projects related to the retarded. Prerequisite: Ed M 170, Py 126, Ed C 210, or their equivalents. *Cr* 3. MR. CHIAPPONE

306. Seminar in Higher Education in the U. S.—An examinaton of the American system of higher education. The history, philosophy, and legal basis of higher education will be studied. Current issues in administration, teachng, research, and student services are examined under leadership of members of University of Maine administration and faculty. *Cr* 3. MR. SHIBLES, MR. WORK

307. Seminar in Language Arts—Discussions and experiences designed to improve the practices and the background of language arts. Prerequisite: Ed M 230, or equivalent. *Cr* 3. MR. CAUGHRAN, MR. ROBERTS

308. Seminar in Student Personnel Problems—Selected problems in student personnel administration will be studied in depth according to needs and interest of seminar participants. Prerequisite: Ed A 255, Ed A 261, Ed G 306, or their equivalents. *Cr* 3. MR. WORK

309. Seminar in College Teaching—Discussion and analysis of effective college teaching practices. The special services which support the instructor's activities will be related to the total teaching process. Open to all graduate students preparing for work on higher education. Registration by permission. *Cr* 3. MR. SHIBLES

315. Seminar in Methods of Teaching—Study and reports of specific problems in the area of teaching. Prerequisite: a basic course in methods or a year of teaching experience. *Cr* 3. MR. SUPPLE

316. Seminar in Audio-Visual Aids—Special problems or projects in the field of audio-visual aids to instruction selected to meet the needs of the individual student. Prerequisite: Ed C 133 or equivalent. *Cr* 3. MR. JUDD

321. Seminar in Social Studies (Secondary)—Problems in curriculum, materials, resources and methods in social studies in the secondary school. Prerequisite: Ed M 141, Ed M 241, or their equivalents. *Cr* 3. MR. MILLER

322. Seminar in Science (Secondary)—Problems in curriculum, materials, resources, and methods in science in the secondary school. Prerequisite: Ed M 142, Ed M 242, or their equivalents. *Cr* 3. MR. DAVIS, MR. BUTZOW

331. Seminar in Elementary School Curriculum—Study and reports on specific problems in the field of curriculum construction and curriculum reorganization. Prerequisite: Ed C 211, Ed 233, or their equivalents. *Cr* 3. MR. BISHOP, MR. GRAY

332. Seminar in Secondary School Curriculum—Study and reports on specific problems in the fields of curriculum construction and curriculum reorganization. Prerequisite: Ed C 221, C 224 and C 233, or their equivalents. *Cr* 3. MR. BISHOP

341. Seminar in Supervision—Problems related to the improvement of instruction. In general, the problems studied will be determined by the needs of the class. Prerequisite: Ed L 210, Ed L 311, Ed L 321, or their equivalents. *Cr* 3. MR. PORTER-SHIRLEY, MR. VROOMAN, MR. GRAY

342. Seminar in School Administration—Problems related to the operation

and control of the school. Prerequisite: Ed L 210, Ed L 311, Ed L 321, or their equivalents. *Cr* 3. MR. PORTER-SHIRLEY, MR. VROOMAN

343. Seminar—The Superintendent—Study and reports on specific problems in the field of high school superintendency. Prerequisite: master's degree in administration. *Cr* 3. MR. PORTER-SHIRLEY

351. Seminar in Measurement and Evaluation—The use of measurement and evaluation in problems of improvement of instruction, pupil counseling and guidance and research in education. Prerequisite: Ed A 320, or equivalent. *Cr* 3. MR. PRESCOTT

361. Seminar in Guidance—Study of current problems in guidance and the development of individual projects in guidance activities. Prerequisite: Ed A 251, Ed A 255, Ed A 353, or their equivalents. *Cr* 3. MR. MURO, MR. RYAN

362. Advanced Seminar in Counseling, Guidance, and Student Personnel Administration—A seminar designed to afford the doctoral student an opportunity to make an intensive study of research literature and to explore and clarify his philosophy and goals within the total field of counseling, guidance and student personnel administration. Open only to doctoral students. *Cr* 3. MR. SANFORD, MR. MURO, MR. RYAN, MR. WORK

373. Seminar in Business Education (Administration and Supervision)—Problems related to administration and supervision in business education. Prerequisite: Ed V 271, Ed V 272, and Ed V 275, or their equivalents. *Cr* 3.

375. Advanced Seminar in Science Education—Studies will include the major forces currently shaping school science instruction, science teacher education, and research in science teaching. Open only to advanced graduate students. Prerequisite: Ed G 304, or Ed G 322, or consent of the instructor. *Cr* 3. MR. DAVIS, MR. BUTZOW

376. Advanced Seminar in Social Studies Education—The major forces currently shaping social studies instruction, social studies teacher preparation, and research in social studies teaching are identified and studied. Prerequisite: Ed M 215, or Ed M 241, and Ed G 303, or Ed G 321, or equivalent courses, or with the permission of the instructor. *Cr* 3. MR. SUPPLE, MR. MILLER

391. Graduate Apprenticeship—Apprenticeship training in one of the following areas such as supervision, administration, guidance or student personnel services in higher education. Usually available only to full-time graduate students who gain permission of instructor well in advance of class meeting. Prerequisite: permission of instructor and adviser to graduate students. *Cr* 2-6.
MR. PORTER-SHIRLEY, MR. SANFORD, MISS ZINK, MR. MURO, MR. RYAN, MR. WORK

393. Educational Internship—This internship provides on-the-job experience and normally comes after a master's degree has been completed. Special arrangements have to be made with either cooperating University departments, community agencies, or public schools, so the instructor must know well in advance. Prerequisite: permission of instructor and adviser to graduate students. *Cr* 3. MR. RYAN, MR. MURO

396. Doctoral Seminar in Education—Doctoral students present doctoral thesis proposals to faculty and students for criticism. Required before approval of student's dissertation title may be obtained from his advisory committee. Open only to doctoral students. *No credit.* STAFF

397. Advanced Educational Research I—An integration of research theory and methodology, measurement theory, and statistics. Development of hypo-

theses, principles of research design, sampling techniques, and methods of analyzing data will be considered. Concepts from measurement theory and statistics necessary for sound research design are included. Students are expected to participate in the solution of research problems. Required of master of science, master of arts, and doctoral candidates. *Cr* 6. MR. PRESCOTT, MR. DRUMMOND

398. Advanced Educational Research II—A continuation and extension of Ed G 397 in which more sophisticated research designs—particularly experimental—are considered. Principles underlying construction and use of instruments for purposes of measurement in research will be continued. Multivariate analysis, analysis of variance and covariance, and nonparametric methods will be introduced as they apply to the solution of educational research problems. Specific topics emphasized will reflect the particular needs of students planning doctoral dissertations. Required of doctoral candidates. Prerequisite: Ed G 397. *Cr* 2-6. MR. PRESCOTT, MR. DRUMMOND

399. Graduate Thesis—Required of candidates for the master of arts or master of science degree. *Cr* 6. *Time arranged.* STAFF

History and Philosophy (Ed H)

2. History of Education—A study of educational thought in its historical bearings with particular emphasis on current modes of thought relative to the values, objectives, purposes, and outcomes of American education. *Cr* 3.
MR. DUPLISSEA

History and Philosophy (Ed H)

100. Trends in Adult Education—Need for and purpose of adult education programs. Consideration of learning program development, organization, and administration of programs. Emphasis on adult education through the public schools, Cooperative Extension Service, and community agencies. *Cr* 3. MR. AXFORD

130. Trends in Education—Discussion of issues in American education as they relate to current and emerging practices in organization curriculum and teaching in the schools. Prerequisite: Ed B 2, or equivalent course. *Cr* 3.
MR. SHIBLES, MISS JARDINE, MR. GRAY

151. Education for Intercultural Understanding—Forces of international, racial and religious conflict in contemporary community life; ways in which schools teach understanding of and adjustment to such cultural conflicts. *Cr* 3.
MR. EMERICK

261. Comparative Education—An analysis of the forces that create differences between national systems of education. England, France, U.S.S.R. and the United States are studied specifically. Prerequisite: Ed B 2, Ed B 3, Ed B 4, or their equivalents. *Cr* 3. MR. NICHOLS

362. Philosophy of Education—Contributions of philosophers to modern education. An analysis of principles and practices of schools in relation to ideals as contributed by the philosophers. Prerequisite: Ed B 2, Ed B 3, and Ed B 4 or their equivalents. *Cr* 3. MR. SUPPLE

School Leadership (Ed L)

151. Organization and Administration of Adult Education—The organization, financing, staffing, promotion, and evaluation of programs of adult education. Teaching resources and the role of the adult education administrator are

given major emphasis. Senior standing, graduate standing, or permission of the instructor. *Cr* 3. MR. AXFORD

210. School Administration and Supervision—Nature and scope of democratic administration and supervision of the public schools, including selected problems in areas such as personnel policies, finance, public relations, evaluation techniques, and supervisory practices. Prerequisite: Ed B 2, Ed B 3, and Ed B 4 or their equivalents. *Cr* 3. MR. PORTER-SHIRLEY, MR. VROOMAN

230. Public Relations—Practical application of techniques and approaches in the development of a desirable public relations program for schools; an evaluation of reporting practices, and the participatory process in working with lay citizens of a community. Prerequisite: Ed L 210 or equivalent. *Cr* 3.

231. School Law—A study of the legal bases of public education in the state of Maine. Prerequisite: Ed B 2, Ed B 3, and Ed B 4 or their equivalents. *Cr* 3. MR. BISHOP

311. The Elementary School Principalship—Organization and administration of the elementary school, with special emphasis upon the duties of the elementary school principal. Prerequisite: Ed L 210, or equivalent. *Cr* 3. MR. VROOMAN

321. The Secondary School Principalship—Organization and administration of the secondary school, with special emphasis upon the duties of the secondary school principal. Prerequisite: Ed L 210, or equivalent. *Cr* 3. MR. NICHOLS, MR. BISHOP

330. School Finance and Business Management—Making and presenting school budget proposals; purchasing and accounting; administering the school budget; legal requirements of budgetary practices. Prerequisite: master's degree with emphasis in school administration and permission of the adviser to graduate students in education. *Cr* 3. MR. PORTER-SHIRLEY

340. Housing the School Program—Population and building surveys; construction and maintenance of school buildings; legal aspects of schoolhouse building. Prerequisite: master's degree with emphasis in school administration and permission of the adviser to graduate students in education. *Cr* 3. MR. PORTER-SHIRLEY

350. School Personnel Management—Recruitment, assignment, and in-service training of teachers; techniques of job analysis and evaluation; leave, tenure and salary policies, staff participation in management. Prerequisite: master's degree with emphasis in school administration and permission of the adviser to graduate students in education. *Cr* 3. MR. PORTER-SHIRLEY, MR. VROOMAN

351. Theory of Administration—The theory and principles of educational leadership. An advanced course. Prerequisite: MEd with emphasis in school administration and permission of adviser to graduate students in education. *Cr* 3. MR. VROOMAN

360. Educational Surveys of the School System—Nature, source and analysis of information basic to planning and operating the local school system; patterns for organizing local systems into larger units; methods of informing the community of the purposes of the survey; procedures for implementing the survey recommendations; the techniques for keeping the survey results up to date. Prerequisite: master's degree with emphasis in school administration and permission of the adviser to graduate students in education. *Cr* 3. MR. PORTER-SHIRLEY

Methods (Ed M)

13. Teaching of Reading in the Elementary School—General background for teaching reading in the elementary school; reading readiness, comprehension, word analysis skills, directed reading lessons, recreational reading, and evaluation. An introductory course. Prerequisite: Py 1 and Py 2; open to juniors and seniors. *Cr* 3. MISS JARDINE, MR. LOWELL, MR. THOMAS

18. Teaching Language Arts in the Elementary School—Current methods and materials in teaching handwriting, spelling, oral and written composition; analysis and correction of basic difficulties. Prerequisite: Py 1 and 2; open to junior and seniors. *Cr* 3. MR. CAUGHRAN, MR. ROBERTS, MR. LOWELL

114. Teaching Arithmetic in Elementary School—The arithmetic curriculum in the elementary school; methods and the techniques in teaching arithmetic; the arithmetic readiness program; instructional and evaluation material. An introductory course. Prerequisite: Py 1, Py 2, Ms 107, junior or senior standing. *Cr* 3. MRS. BOYCE

115. Teaching Social Studies in the Elementary School—Methods and materials for social studies in the elementary school; ways of relating the work of the social studies class to the understanding of practical problems of the community. Prerequisite: Py 1, Py 2, junior or senior standing. *Cr* 3. MR. SUPPLE

116. Teaching Science in the Elementary School—Materials, methods, devices, and activities appropriate to the program of science in the elementary school. Prerequisite: Py 1, Py 2, junior or senior standing. *Cr* 3.
MR. DAVIS, MR. BUTZOW

120. Teaching Geography in the Elementary School—Materials, methods, devices, activities, and appropriate background information to the program of teaching geography in the school. Prerequisite: Py 1, Py 2, junior or senior standing. *Cr* 3. MR. SUPPLE

130. Education of the Trainable—The contents of this course are family, social, and educational implications of the trainable mentally retarded child with emphasis being placed on the latter. Teaching methodology appropriate to the needs of the trainable child, as well as curriculum, goals, etc., are also included. Prerequisite Ed B 2, Ed B 3, Ed B 4, or their equivalents. *Cr* 3.
MR. CHIAPPONE, MR. WILLIAM DAVIS

140. Teaching Reading in the Secondary School—Appraisal of reading achievements and needs; teaching reading and study skills in the content areas; survey of reading programs in the junior-senior high school. Prerequisite: Py 1, Py 2, junior or senior standing. *Cr* 3. MR. ROBERTS

141. Teaching Social Studies in the Secondary School—Current practices in teaching social studies; selection and use of instructional materials; modern trends in curriculum construction for social studies in the secondary school. Prerequisite: Py 1, Py 2, junior or senior standing. *Cr* 3. MR. MILLER

142. Teaching Science in the Secondary School—Methods and materials in teaching of science; development of the science curriculum, and equipment, supplies, and supplementary materials for science teaching in the secondary schools. Prerequisite: Py 1, Py 2, junior or senior standing. *Cr* 3.
MR. DAVIS, MR. BUTZOW

143. Teaching Geography in the Secondary School—Materials, methods, devices, activities, and appropriate background information to the program of

teaching geography in the school. Prerequisite: Py 1, Py 2, junior or senior standing. *Cr* 3. MR. SUPPLE

150. Newer Practices in Reading—Objectives, materials, and procedures for the improvement of the teaching of reading; methods and materials used in evaluating the reading program; comparison of current practices in reading instruction. Prerequisite: Ed M 13 or Ed M 140, or their equivalents. *Cr* 3.
MR. CAUGHRAN, MR. ROBERTS, MR. LOWELL

165. Methods of Teaching the Superior Child—Methods, materials and techniques for teaching the gifted child. Prerequisite: Ed B 2, B 3, B 4 or their equivalents. *Cr* 3.

170. Methods of Teaching the Retarded Child—Methods, materials, and techniques in teaching retarded children at the special class level. Prerequisite: Ed B 2, Ed B 3, Ed B 4 or their equivalents. *Cr* 3.
MR. CHIAPPONE, MR. WILLIAM DAVIS

180. Teaching in Adult Education—A course in methods for teaching adults and makes a critical examination of major problems in teaching and learning in adult education. Emphasis is given to factors which affect learning ability, achievement, motivation to learn through the adult life-cycle. Senior standing, graduate standing, or permission of the instructor. *Cr* 3. MR. AXFORD

OBSERVATION AND STUDENT TEACHING

The University's arrangement for Observation and Student Teaching is generally made a year in advance and based upon the need of students. The demand for this course has increased to the point where it has become necessary to make application with the Director of Student Teaching, Room 144. This application must be approved well in advance of actual registration for the course.

190. Full-Day Student Teaching (Elementary)—A full-day, off-campus internship program in a selected school for one half of the semester; a full-day, on-campus program of college courses is provided for the other half of the semester. Special conferences and group discussions as required. Prerequisites: Ed B 2, Ed B 3, Ed B 4 or their equivalents, methods course, and senior standing. *Cr* 6. MR. NICHOLS AND STAFF

191. Full-Day Student Teaching (Secondary)—A full-day, off-campus internship program in a selected school for one half of the semester; a full-day, on-campus program of college courses is provided for the other half of the semester. Special conferences and group discussions as required. Prerequisites: Ed B 2, Ed B 3, Ed B 4, or their equivalents, methods course, and senior standing. *Cr* 6. MR. NICHOLS AND STAFF

192. Half-Day Student Teaching (Elementary)—A half-day program of observation and student teaching in a selected school in the University area. The same four consecutive periods must be free daily in order to schedule this course. Special conferences and group discussions as required. Prerequisites: Ed B 2, Ed B 3, Ed B 4, or their equivalents, methods course, and senior standing. *Cr* 6.
MR. NICHOLS AND STAFF

193. Half-Day Student Teaching (Secondary)—A half-day program of observation and student teaching in a selected school in the University area. The same four consecutive periods must be free daily in order to schedule this course.

Special conferences and group discussions as required. Prerequisites: Ed B 2, Ed B 3, Ed B 4, or their equivalents, methods course, and senior standing. *Cr* 6.
MR. NICHOLS AND STAFF

194. Student Teaching, K-12 (Music or Art Education)—A program of observation and student teaching in selected elementary and secondary schools. Special conferences and group discussions as required. Prerequisites: Ed B 2, Ed B 3, Ed B 4, or their equivalents, a methods course, and senior standing. *Cr* 6.
MR. LEWIS, MR. NESBIT

200. Field Observation (Activity)—Study of educational programs through visitation, consultation, and appraisal of practices as observed in selected schools, instructional centers, clinics, laboratories and related community agencies. Analysis of field observation with research, theory and practice. Prerequisite: permission of instructor. *Cr* 2. MR. SANFORD, MR. MURO, MISS JARDINE

215. Newer Practices in Social Studies in the Elementary School—A study of the literature, research, materials, and emerging curriculum practices in the social studies program in the elementary schools. An advanced course. Prerequisite: Ed M 115 or equivalent. *Cr* 3. MR. SUPPLE

216. Advanced Studies in Science Education (Elementary)—These studies will include a critical appraisal of contemporary programs in elementary school science, a review of the relevant research in teaching and learning science at this level, and practice in planning and conducting laboratory and field investigations. Prerequisite: Ed M 116 or equivalent. *Cr* 6. MR. DAVIS, MR. BUTZOW

230. Advanced Study in Language Arts—Intensive study of literature, research, and current practices in the teaching of the language arts. Primarily for thesis candidates. Prerequisite: permission of instructor. *Cr* 3. MR. ROBERTS

241. Newer Practices in Social Studies in the Secondary School—A study of the literature, research, materials, and emerging curriculum practices in the social studies program in the secondary schools. An advanced course. Prerequisite: Ed M 141 or equivalent. *Cr* 3. MR. MILLER

242. Advanced Studies in Science Education (Secondary)—These studies will include an appraisal of school science programs at all levels with special attention given to the recent curricular developments intended for secondary schools, a review of the relevant research in teaching and learning science at this level, and practice in planning and conducting laboratory and/or field investigations. Prerequisite: Ed M 142 or equivalent. *Cr* 3 MR. DAVIS, MR. BUTZOW

251. Newer Practices in Arithmetic—Objectives, materials and procedures for the improvement of the teaching of the fundamentals of arithmetic; an arithmetic readiness program, a sensible drill load, and the development of meaningful problem units. Prerequisite: Ed 114 or equivalent. *Cr* 3. MRS. BOYCE

253. Remedial Reading—Diagnosis and correction, methods, materials and procedures for corrective work. Corrective work with an individual or group. Prerequisite: Ed M 140, or Ed M 150, or their equivalents, and teaching experience. *Cr* 3. MR. CAUGHRAN, MR. ROBERTS, MR. LOWELL

269. Clinical Practices in Reading—Practice in diagnosing and correcting reading deficiencies in elementary and secondary school children. Prerequisite: Ed M 253 or equivalent, and permission of instructor. *Cr* 6. MR. LOWELL

272. The Education of the Superior Child—Deals with characteristics, identification, educational provisions, adjustment and guidance of superior students.

280. Educational Institute (Activity)—An institute designed to provide understanding and insight into areas of special concern in education, such as the education of the teacher of the disadvantaged, the teacher of the retarded, guidance counselor, the reading specialists, etc. Special attention will be given to the literature, research, practices and materials relating to an aspect of education. *Cr* 3-6. MR. SANFORD, MR. LINDLOF, MR. MURO, MR. CHIAPPONE, MISS JARDINE

301. Diagnosis in Reading—Theory, demonstration, and practice in the diagnosis and appraisal of factors in reading and related areas. Emphasis is on the construction and use of teacher-made measuring instruments designed to appraise word perception, vocabulary, and comprehension skills, and other facets of reading performance. Prerequisite: Ed M 269. Ed A 320, or their equivalents, and permission of instructor. *Cr* 3. MR. ROBERTS

310. Learning Disability and the Handicapped — A review of prominent theories related to interferences in educational functioning. Restructuring of special class organization to meet psychological, social, and psychosensory needs is included as well as familiarization with pertinent techniques appropriate to the recognition of the problem of the multiply handicapped. Prerequisite: Py 126, Py 157, Ed C 210 and Ed M 170. *Cr* 3. MR. CHIAPPONE

320. Theories of Teaching—A study of the major theoretical formulations concerned with rationalizing teacher behavior. Several theories will be compared and their utility generating research evaluated. Prerequisite: a course in teaching practices, or teaching experience. *Cr* 3. MR. DAVIS

357. Education Practicum (Activity) — Intensive supervised practice in applying professional skills to such activities as counseling, group work, individual appraisal, language arts instruction, supervision, testing. The activity will be elected by the student with the consent of his adviser. Usually available only to students who gain permission of instructor well in advance. (Note: the activity will be designated in parenthesis as part of the course title at the time of registration.) Prerequisite: permission of the instructor. *Cr* 3.

MR. SANFORD, MR. RYAN, MR. WORK, MR. MURO, MR. CAUGHRAN, MR. PORTER-SHIRLEY, MR. JOHNSON, MISS JARDINE

Vocational (Ed V)

271. Improvement of Instruction in the Vocational Business Subjects—An advanced course covering methods, selection of instructional materials and curriculum building in vocational business subjects. Enrollment open only to experienced teachers of business education. *Cr* 3.

272. Improvement of Instruction in the Non-vocational Business Subjects—An advanced course covering methods, selection of instructional materials and curriculum building in non-vocational business subjects. Enrollment open only to experienced teachers of business education. *Cr* 3.

275. Business Education Curriculum—This course deals with the curricula in business education for various levels and types of schools. The student learns how to evaluate present programs and to make recommendations for needed changes. *Cr* 3.

General (Ed X)

51. Basic Driver Education—A short, basic, intensive course in driver education for teachers has been arranged in cooperation with the American Auto-

mobile Association. This training is designed specifically to aid high schools in establishing plans for a course in driver education, not for the purpose of teaching an individual how to drive. *Cr* 3.

52. Driver and Traffic Safety Education—An intensive course in driver and traffic safety education for teachers who have completed the basic course in driver education, Ed X 51, and have had a minimum of one year's teaching experience in this area of education. Deals with problems experienced by teachers in teaching driver education and highway safety. Prerequisite: Ed X 51. *Cr* 3.

110. Workshop for Cooperative School Personnel (Activity)—A workshop concerning the nature and scope of the activities of the supervisor, resource teacher, team leader, critic teacher, aids with other school personnel. Attention will be given to the literature, research, practices and materials relating to effective utilization of cooperating school personnel as indicated. *Cr* 3.

MRS. BOYCE, MR. CROXFORD, MR. NICHOLS, MR. GRAY, MISS JARDINE

162. Workshop in Elementary Education (Activity) — A workshop designed to increase the competence of the elementary school teacher, supervisor, curriculum director, administrator, and other school personnel related to the school program. Attention will be given to the literature, research and materials concerned with a special aspect of elementary education. *Cr* 3-6. STAFF

163. Workshop in Conservation Education — Most of this elementary school teacher workshop program relates to the mineral, soil, water, forest, fish, wildlife, and recreational resources of Maine. Field studies are emphasized. *Cr* 3.

172. Workshop in Secondary Education (Activity)—A workshop designed to increase the competence of the director, administrator, and other school personnel related to the school program. Attention will be given to the literature, research and materials concerned with a special aspect of secondary education. *Cr* 3-6. STAFF

173. Workshop in Conservation Education—Same as course 163 except for secondary teachers. *Cr* 3.

181. Educational Travel (Area)—A summer session study tour designed to provide an insight in the social, economic, historical, and geographic aspects of the locale visited with special consideration to those areas which have made major contributions to our cultural heritage. Tours currently conducted to Europe, United States, Maritime Provinces and Quebec. *Cr* 3-6. MR. PORTER-SHIRLEY

198. Problems in Education—Individual work on a problem of the student's own selection. Primarily for majors in education. *Cr Ar.*

MR. BISHOP, MR. FOBES

286. Workshop in Special Education (Activity) — This workshop is designed to provide insight into the educational problems of the mentally retarded, emotionally disturbed, the neurologically impaired, the deaf, the visually handicapped or the gifted. Special attention will be given to the literature, research, practices and materials relating to an aspect of special education. *Cr* 3-6.

MR. CHIAPPONE

398. Individual Study in Education (field of specialization)—Individual study will provide the doctoral student with the opportunity to increase his professional competence in various fields through independent readings and research. In consultation with his advisory committee the student will plan individual

projects which enable him to gain needed competencies in such fields as counseling, guidance, language arts, student personnel. Prerequisite: permission of instructor. *Cr* 3-6.

DIVISION OF MUSIC EDUCATION

The College of Education offers a program in music education for students who intend to make music a career either as a teacher, and/or a supervisor of music. Majors in these programs will register in the College of Education. Upon satisfactory completion of the course of study, the student will graduate with the bachelor of science in education degree and will be certified to teach music in the public schools. Students who are interested in this program should obtain a special folder from the College of Education concerning this program.

DIVISION OF ART EDUCATION

A program in art education is offered by the College of Education. It is designed for the those who plan to teach art or become supervisors of art in the public schools. Students who are interested in this program should obtain a special folder from the College of Education concerning this program.

DIVISION OF PHYSICAL EDUCATION

The professional curriculum in physical education is designed to prepare qualified students to teach health and physical education, to coach athletic teams and to direct recreational programs. It provides for a major in health, physical education and recreation and a second major in an academic teaching area. A bachelor of science degree in education is awarded graduates of this program.

Definite evidence of intellectual capacity, positive qualities of character and personality, good health, and competent proficiency in motor skills are the factors determining admission. Applicants who lack any of these qualities, which are considered essential for professional success in health, physical education, and recreation will be advised to enter some other field of study. Applicants are urged to present at least one unit in a laboratory science.

COURSES OF INSTRUCTION (Pe)

PROFESSORS WESTERMAN, WOODBURY, AND SEZAK; ASSOCIATE PROFESSORS HAAS, BROWN, CASSIDY, BUTTERFIELD, LEPLEY, MCCALL, STYRNA, WALKUP; ASSISTANT PROFESSORS ABBOTT, ANDERSON, COBB, JORDAN, PHILBRICK, PICKETT, WALLACE; INSTRUCTORS AMES, BALANGER, CHAPPELLE, CREIGHTON, DEVARNEY, FOLGER, HADLEY, JORDAN, MACKINNON

(M-men students only; W-women students only)

9m. Team Sports Skills—To develop skills, techniques, and understandings for competency in basketball, football, and volleyball. *Cr* 1. STAFF

10m. Sport Skills—To develop skills, techniques, and understandings for competency in baseball, track and tennis. *Cr* 1.

10w. Sports Skills—To develop skills, techniques, and understandings for competency in volleyball, golf, and tennis. *Cr* 1. STAFF

11m. Team Sports Skills—To develop skills, techniques, and understandings for competency in soccer, speedball, and wrestling. *Cr* 1. STAFF

11w. Team Sports Skills—To develop skills, techniques, and understandings for competency in soccer, speedball, hockey, and basketball. *Cr* 1.

12m. Individual and Dual Sports—To develop skills, techniques, and understandings for competency in golf, archery, badminton, fencing, handball and squash. *Cr* 1. STAFF

12w. Individual and Dual Sports—To develop skills, techniques, and understandings for competency in skiing, swimming, track-field, and archery. *Cr* 1.

13m. Physical Conditioning — To develop skills, techniques, and understandings for competency in mass exercise, floor work. *Cr* 1.

13w. Sports Skills—To develop skills, techniques and understandings for competency in badminton, fencing, softball, and lacrosse. *Cr* 1.

14m. Rhythmic Activities—To develop skills, techniques, and understandings for competency in rhythms, folk dance, and square dance. *Cr* 1. MISS CASSIDY

14w. Rhythmic Activities—To develop skills, techniques, and understandings for competency in rhythms, folk dance, and square dance. *Cr* 1.

15m. Gymnastics—To develop skills, techniques, and understandings for competency in conditioning exercises, tumbling, apparatus, and free exercise. *Cr* 1. MR. WALLACE

15w. Gymnastics—To develop skills, techniques, and understandings for competency in conditioning exercises, tumbling, appartus, and free exercise. *Cr* 1. STAFF

16w. Techniques in Modern Dance—To develop skills, techniques, and understandings for competency in modern dance. *Cr* 1. MISS CASSIDY

50. Camp Leadership—Designed for the training of camp counselors, with emphasis on participation in the varied activities of camping. In addition to the regular two hours per week in the classroom, field trips will be arranged. *Cr* 2. MR. SEZAK

56. Physical Education in the Elementary School—Designed to give organizational procedures for curriculum construction, contributions of current research, and selection of content for the elementary school program. Activity participation in the specific areas of dance, gymnastics, sports and games, and aquatics. *Cr* 2. MISS HAAS

61m. Methods of Team Sports—Emphasis on appropriate techniques used in teaching team sports and lead-up activities. Includes laboratory experiences, the use of teaching aids, organizational procedures, and evaluative processes. *Cr* 2. MR. WOODBURY

61w. Methods of Team Sports—Emphasis on appropriate techniques used in teaching team sports and lead-up activities. Includes laboratory experiences, the use of teaching aids, organizational procedures, and evaluative processes. *Cr* 2. MISS HAAS

62m. Methods of Individual and Dual Sports — A continuation of Pe 61m, with emphasis on individual and dual sports. *Cr* 2. MR. WOODBURY

62w. Methods of Individual and Dual Sports — A continuation of Pe 61w, with emphasis on individual and dual sports. *Cr* 2. MISS WALKUP

63m. Coaching Techniques—Practical instruction in football and basketball for men preparing to enter the coaching profession. *Rec* 2, *Cr* 2. MR. ABBOTT, MR. MCCALL

63w. Methods in Modern Dance—An intensive study of modern dance, with special emphasis on teaching techniques, theory, and principles of composition. Prerequisite: Pe 14w. *Rec* 3, *Cr* 2. MISS CASSIDY

64m. Coaching Techniques — Devoted to a study of the mechanics of running, jumping, and weight throwing, with discussions of different styles involved in track and field activities; also a study of approved methods in coaching baseball in all its phases. *Rec* 2, *Cr* 2. MR. STYRNA, MR. BUTTERFIELD

65m. Coaching Techniques—Practical instruction in wrestling and soccer for men preparing to enter the coaching profession. *Rec* 2, *Cr* 2.
MR. MACKINNON, MR. LIVESEY

69. Foundations of Recreation — Fundamental concepts, principles, and practices in the field of recreation, with emphasis on historical and philosophical backgrounds. *Cr* 2. STAFF

73. Athletic Training—Prevention and care of injuries in athletic activities; the use of proper personal and field equipment, support methods, conditioning exercises, the medical examination, and therapeutic aids. *Rec* 1, *Lab* 2, *Cr* 2.
MR. JORDAN

78. Health Education—Stress is placed on elements of services, facilities, and instruction at elementary and secondary school levels as they influence habits of positive health. *Cr* 2-3. MR. LEPLEY

145. Community Centers and Playgrounds—Covers various aspects of organization, administration, management, facilities, equipment, and activities of building-centered programs and community playgrounds. *Cr* 3. STAFF

148. Field Experience — Supervised experience in conducting recreation programs in camp, community, social agency or institution situations. Enrollment by permission. *Cr* 3-6. STAFF

165. Leadership Organization in the Intra-Extramural Programs—Principles and philosophy, administration, organization, and supervision of intra-extramural activities in the physical education program in elementary, junior, and senior high schools. *Cr* 3. MR. LEPLEY

168. Protective Practices and Safety in Physical Education and Athletics—Designed to acquaint teachers and athletic coaches with modern principles and practices in prevention, treatment, rehabilitation, and safety in physical education and athletics. *Cr* 3. MR. WOODBURY, MR. COBB

171. History and Philosophy of Physical Education—Designed to develop an appreciation of the place and function of physical education during the course of civilization and to assist in the formation of a constructive approach to present day problems in this area. *Cr* 2-3. MR. LEPLEY

172. Tests and Measurement in Physical Education—Techniques and devices for the evaluation of physical education programs. Includes the selection and administration of traditional physical performance tests, the construction of teacher-made tests specific to instructional programs in physical education and the knowledges and understandings basic to interpretations of test scores. *Cr* 3.
MISS WALKUP

176. Kinesiology—Introduction to the analysis of movement patterns based on precepts necessary for the application of basic mechanics and kinesiological principles to the teaching of motor skills. *Cr* 3. MISS WALKUP

180. Health, Physical Education, and Recreation Programs in the Elementary School—Study of skills, progressions in rhythms, sports, and gymnas-

tics. Health programs including curriculum planning, and methods of presentation. Organization and administration of elementary school recreation programs. For elementary classroom teachers. *Cr* 3. MISS ANDERSON

183. Planning the Health Education Curriculum—Designed to assist the student in more thoroughly understanding health education in relation to the total school curriculum. Concepts of curriculum development, national considerations, and current research related to curriculum constructions are examined and evaluated. *Cr* 3. MR. LEPLEY, MR. COBB

184. Practicum in Physical Education—Leadership experiences under staff supervision in the service program. Consult either Dr. Haas or Mr. Woodbury before registering. *Cr* 1-3. STAFF

185. Program Planning in Recreation and Camp Organization—Skills and practical experiences essential to the development and organization of an effective recreation and camp program. *Cr* 3. MR. SEZAK

198. Problems (Activity)—Individual work on a problem in the area of health, physical education and recreation. *Cr* 1-3. STAFF

270. Interpretation of Health, Physical Education, and Recreation—An analytical interpretation of the broad spectrum of activity through history and philosophy, methods, measurement, content, public relations and professional preparation. Prerequisite: Pe 171 and Pe 172. *Cr* 3. MISS HAAS, MR. LEPLEY

272. Planning the Physical Education Curriculum—A selection of activities sequentially arranged and organized to produce a curriculum for physical education for the modern school. Consideration is given to time allotments, facilities, individual characteristics and problems of appraisal. Prerequisite: Pe 61 and Pe 62. *Cr* 3. MISS HAAS

275. Current Studies in Health, Physical Education, and Recreation—Critical analysis of current and emerging trends in health, physical education, and recreation based on contributions from experimental research, literature and empirical observations. *Cr* 3. MISS HAAS

276. Physiology of Activity—A study of the interrelationships of exercise and the human physiologic mechanisms which limit man's capacity for muscular work. Prerequisite: Advanced Study in Physiology. *Cr* 3. MR. LEPLEY, MR. COBB

277. Organization and Administration of Health, Physical Education and Recreation—Programming, personnel, finance, and budgets, equipment, facilities, and other administrative aspects of programs of health, physical education and recreation. *Cr* 3. MISS HAAS, MR. LEPLEY

280. Mechanical Analysis of Human Movement—An analysis of various motor activities to provide the student with scientific basis for teaching and evaluating correct form for the execution of the fundamental movements. Prerequisite: Pe 176. *Cr* 3. MISS WALKUP

282. Physical Education for the Exceptional — Modifications of instructional programs to the needs of atypical individuals within the regular school curriculum. Includes methods of evaluation of body mechanics, programs of correction, and recognition of behavioral patterns. Prerequisite: Pe 176. *Cr* 3. MISS WALKUP

284. Evaluative Procedures in Health, Physical Education, and Recreation—An analysis of evaluative programs in health education, physical education and recreation; with special emphasis on test administration and test construction. Specific attention will be given to current evaluation practices in the use of

tests to measure knowledges, attitudes, skills, and status. Prerequisite: Pe 172. *Cr* 3. MISS WALKUP, MR. LEPLEY

310. Seminar in Health, Physical Education, and Recreation—Deals with problems in physical education through study and world-wide practices, past, present, implications for the future. *Cr* 3. MR. LEPLEY

COURSES TO BE OFFERED PERIODICALLY

(All courses are 3 credit hours except as noted by figure in parenthesis following course title.)

Seminars, Research and the Thesis (Ed G)

365. Seminar in Self-Actualization.

366. Advanced Seminar in Human Development.

395. Educational Research.

Methods (Ed M)

271. Observation and Practice in Special Class Education.

273. Problems in Teaching the Slow Learning Child.

Physical Education (Pe)

155. Philosophy and Organization of Physical Education for Elementary Schools.

274. Organization and Administration of Recreation Programs.

279. Current Studies in the Administration of Athletics.

281. Recreation in the American Community.

283. Administration of Elementary and Secondary School Health Program.

Ed X—General

121. National Training Laboratory in Human Relations Training.

122. Laboratory in Personal Growth (Advanced), formerly, National Training Laboratory in Personal Growth and Creative Expression.

123. National Training Laboratory in Conflict Management (Advanced).

124. Human Relations Factors in Guidance.

125. National Training Laboratory for Community Leaders.

126. National Training Laboratory for Educational Leaders (Advanced).

127. National Training Laboratory for Leadership in Higher Education.

128. National Training Laboratory Internship on Educational Change. (5)

129. National Training Laboratory for School Administrators.

130. Program for Specialists in Organizational Training and Development, formerly, National Training Laboratories Internship on Organizational Behavior.

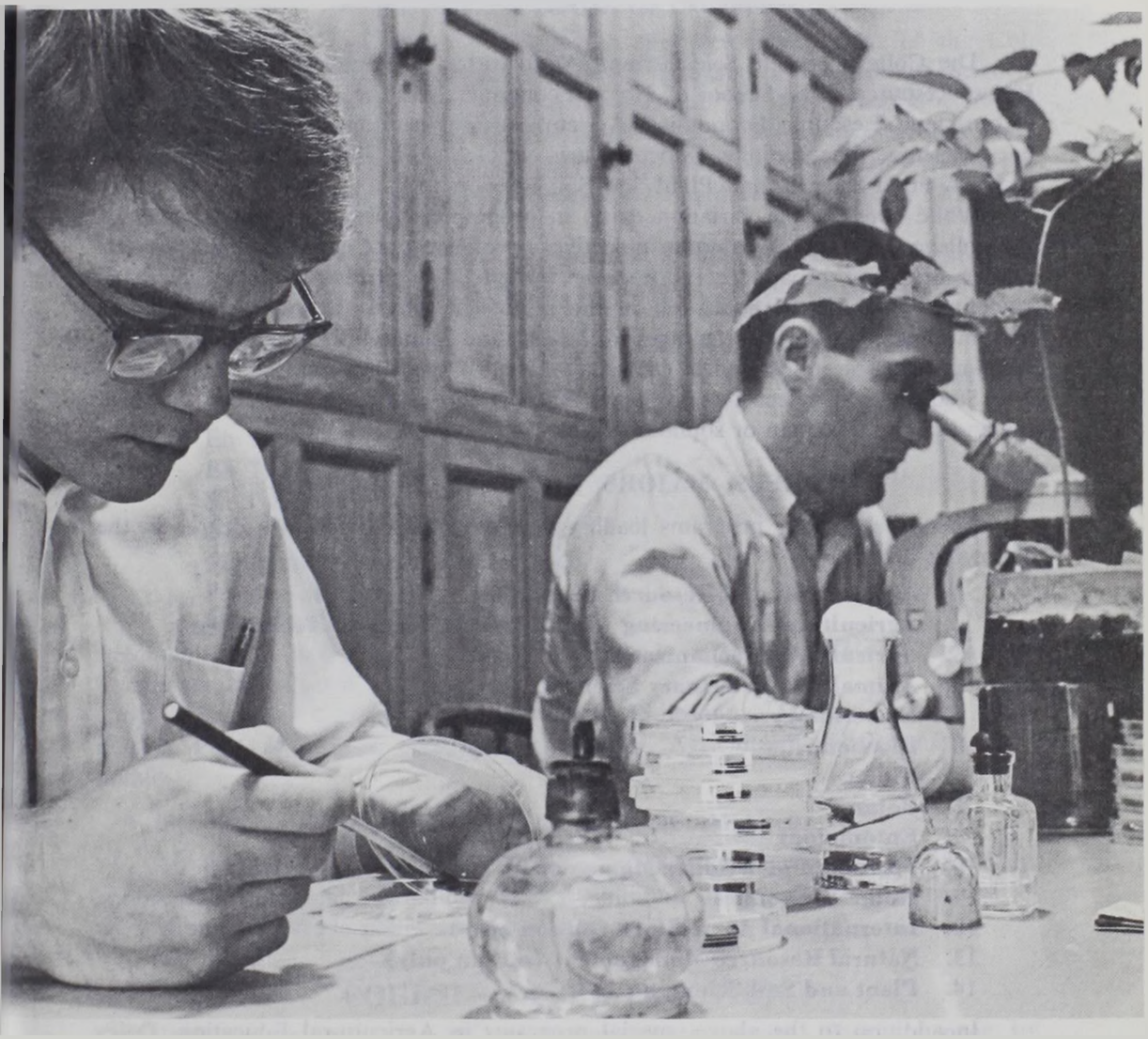
131. Laboratory in Consultation Skills (Advanced) 2, formerly, Laboratory in Organizational Consultation (Advanced).

150. Aerospace Science Education Workshop.

(The foregoing, except 150, are offered in cooperation with the National Training Laboratory, Bethel, Maine.)

COLLEGE OF LIFE SCIENCES AND AGRICULTURE

BRUCE R. POULTON, DEAN



College of Life Sciences and Agriculture

The College of Life Sciences and Agriculture is composed of the School of Forest Resources, The School of Home Economics, and the Departments of Agricultural and Resource Economics, Agricultural Engineering, Animal and Veterinary Science, Bacteriology, Biochemistry, Botany and Plant Pathology, Entomology, Food Science, and Plant and Soil Sciences.

While considerable variation exists in program requirements among units of the college, all have as common objectives: proficiency in a professional subject-matter field and broad, liberal training for effective citizenship. This gives the student a fundamental education in the biological, physical, and social sciences and an opportunity to elect courses in the arts and humanities. In addition, specific technical courses are offered in each major area of specialization.

Students may select a major upon entering the college or they may do so at the end of the freshman or sophomore year.

DEGREES, MAJORS, AND SPECIALIZATIONS

The college offers programs leading to the bachelor of science degree in the following fields:

1. **Agricultural and Resource Economics**
2. **Agricultural Engineering (Jointly with College of Technology)**
3. **Agricultural Mechanization**
4. **Animal and Veterinary Sciences**
5. **Bacteriology**
6. **Biochemistry**
7. **Biology**
8. **Botany**
9. **Entomology**
10. **Forestry and Wildlife Management**
11. **Home Economics**
12. **International Agriculture (option only)**
13. **Natural Resource Management (option only)**
14. **Plant and Soil Sciences**

In addition to the above, special programs in Agricultural Education, Dairy Manufacturing, and Food Processing are offered as part of the New England Board of Higher Education plan for regional cooperation. This agreement per-

mits students to complete two-year preparatory programs at the University of Maine and to transfer to other specified New England universities for the remaining two years of professional training. A two-year Pre-Veterinary curriculum is provided for those who wish to qualify for entrance into a regular college of veterinary medicine.

The college has a Two-Year Technical Division that offers associate degree technical training to young men and women in Animal Technology, Animal Medical Technology, Business Management (including options in Food Industry Management, Agricultural Business Management, and Horticultural Management), Forest Management, Food Service Management and Merchandising.

GRADUATION REQUIREMENTS

Bachelor of Science Degree Candidates

Completion of course work required in the various programs of the College of Life Sciences and Agriculture leads to a degree of Bachelor of Science. All students are required to complete a minimum of 120 degree hours, exclusive of credit for basic military training. The School of Forest Resources requires 132 credit hours plus 8 credit hours of summer camp and a one-hour spring trip in the Forestry and Wildlife programs, and Agricultural Engineering requires a 129 credit hour requirement.

In addition, each student must accumulate a minimum grade point average of 1.8 and receive a passing grade in all required courses in the program of study.

General subject matter requirements of all degree candidates are:

		cr. hrs.
Communications:		9
Eh 1 Freshman Composition	3	
Eh 7, 8, or 17 Composition	3	
Sh 1 Speech	3	
Humanities and Social Sciences:*		15
Minimum of two courses in each		
Physical Education:		0
Minimum of two semesters		

**Humanities:* Courses in Literature, Philosophy Pl 1, 2, History Hy 1, 2; Foreign Languages; Music; Art.

Social Sciences: Courses in Anthropology, Philosophy, Modern Society, Economics, Political Science, Sociology, Psychology, Agricultural and Resource Economics.

Associate of Science Degree Candidates

For the degree of Associate of Science, students must complete satisfactorily a prescribed technical curriculum with a minimum of 64 credit hours earned at an accumulative grade point average of at least 1.8.

COURSES OF INSTRUCTION

Courses numbered 1 to 99 are undergraduate courses. They are open to graduate students but credit earned in these courses may not be used to satisfy advanced degree requirements. Courses numbered 100 to 199 are upperclass

undergraduate courses which may be used for graduate degree credit by graduate students if given prior approval by the graduate student's advisory committee. Courses numbered 200 to 299 are graduate courses which may be elected by undergraduate honor students, or those undergraduates whose advancement in the field will permit their taking a graduate level course among graduate students without disadvantage to themselves. Courses numbered 300 to 399 are graduate level courses which may be taken only by students admitted to the Graduate School.

Courses credited towards the baccalaureate and higher degrees are listed with the departmental abbreviation first, followed by the course number, e.g., AnV 45 —Animal Science; courses credited towards the two-year associate degrees are listed with the course number first and the departmental designator second, e.g., 5 AnV—Milk Composition and Testing.

One number is used for a course which is given both fall and spring.

When a dash is used between the two numbers (e.g., 1-2), both semesters must be taken to obtain credit; when a slant is used (e.g., 1/2), the first semester may be taken by itself, but the second semester cannot be taken unless the first is taken previously; when a period is used (e.g., 1.2), either semester may be taken for credit.

Courses offered in 1969-70 and alternate years are indicated by the sign (‡) placed before the number of the course; courses offered in 1968-69 and alternate years are indicated by the sign (†) placed before the number of the course.

GENERAL PROGRAMS AND COURSES

HONORS PROGRAM

PROFESSORS CAMPANA, DIMOND, SIMPSON; ASSOCIATE PROFESSORS GERSHMAN, KROFTA, O'MEARA; ASSISTANT PROFESSOR LANGILLE

Students enrolled in the College of Life Sciences and Agriculture are eligible to participate in the University Honors Program. Freshmen and sophomores participate in the interdisciplinary University program; the work of the junior and senior years is conducted by the various departments of the college. For general information concerning the Honors Program, refer to the Honors Section in this catalog or contact the Secretary of the College Honors Committee, Professor Richard J. Campana.

41. Distinguished Freshman Seminar—Limited to 72 freshman students, by invitation. Discussions and demonstrations displaying the range and nature of the liberal arts and the sciences. *Cr* 3. MR. SIMPSON, Chairman

45. Honors Colloquium—Readings and discussions on the basic concepts of Western civilization. *Cr* 3.

47. 48. Honors Group Tutorial—Oral and written reports, under tutorial direction, upon a planned sequence of books representative of the various fields of liberal education. Hr 47.48. fulfills the sophomore humanities requirement for those students registered in the Honors Program. *Cr* 3. MR. THOMSON, Chairman

51. 52. Honors: Specialized Studies — A tutorially conducted survey of the student's major field, issuing in the choice of an approved thesis topic. *Cr* 3.

53. 54. Honors Thesis—The planning and completion of an honors thesis or research project. *Cr* 3.

Further information concerning the availability of other Honors courses may be obtained from the Secretary of the College Honors Committee.

INTERNATIONAL AGRICULTURAL DEVELOPMENT

This option in International Agriculture is available to any student in the College of Life Sciences and Agriculture. The student would have as his primary emphasis an existing major field of study and become involved in international agriculture by selecting this option as a minor field of study. Such supplemental training is intended to give the student a better understanding of developmental problems in the underdeveloped countries of the world, and to provide useful skills for active involvement.

Curriculum for Option in International Agricultural Development

Required Courses				**15 Hours**
P/AnV	43	Tropical Agriculture	3	
ARE	81	Agriculture and Economic Development	3	
AE	37	Agricultural Engineering for Developing Countries	3	
Foreign Language		(Two semesters one language)	6	
Elective Courses				**11 hours**
(Minimum of 11 credit hours selected from the following:)				
ARE	24	Sociology of Rural Life	3	
ARE	42	World Population Resources	3	
ARE	124	Contemporary Rural Problems	3	
ARE	150	Human Factors in Resource Development	3	
ARE	186	Policies of World Agriculture	3	
Ay	141, 153, 155, 160	People and Cultures	3 each	
Ay	165	Political Anthropology	3	
Ay	167	Peasant Societies	3	
Ec	139/140	International Trade and Commercial Policy	3/3	
Fn	1	Principles of Nutrition	3	
Ge	2	World Regional Geography	3	
Hy	7, 8	Asian Civilization	3/3	
Hy	138	Problems of Southeast Asia	3	
Hy	149	Argentina, Brazil, and Chile	3	
Hy	150	Mexico	3	
Hy	152	Problems of Latin America	3	
Pol	173/174	International Relations	3/3	
Pol	165	Government of South Asia	3	
	166	Government of East Asia	3	
Pol	167	Emerging Africa	3	
Pol	168	Government in Latin America	3	
Pol	194	Asia Political Ideas	3	
Pol	196	International Affairs Internship	3	
Intermediate Foreign Language (Maximum 6 hours)				
Total Hours				**26 hours**

GENERAL COURSES

LSA 1. University Life—A series of lectures and discussions on the history and traditions, rules and regulations of the University; study aids and procedures; advising and counseling services; and professional fields of training. Guest speakers are selected to broaden student understanding and perspective of human affairs. *Lec* 1, *Cr* 0.

LSA 17. 18. Freshman Seminar—Small group discussions of a planned sequence of books and articles dealing with various issues of modern society. Open to all freshmen in the College of Life Sciences and Agriculture other than those enrolled in the University's Honors Program. *Rec* 1, *Cr* 1. MR. PULLEN, Chairman

Mhe. 50. Man and His Environment—Effect of the biological and physical environment on life and man. Restricted to seniors in practice teaching, taken concurrently with Pl 70 and Sy 5ed for one-half semester. *Rec* 6, *Cr* 3.
MR. HUTCHINSON, MR. COCK

FRESHMAN YEAR COURSE PROGRAMS

Students admitted to degree programs of the College of Life Sciences and Agriculture usually enroll in one of the following freshman programs.

Agricultural and Resource Economics

FALL SEMESTER				SPRING SEMESTER			
		Subject	Credit Hours			Subject	Credit Hours
LSA	1	University Life	0	ARE	24	Sociology of Rural Life	3
Ec	1	Prin. of Economics	3	Bt	1	General Botany	4
Ch	11	Chemistry	4	Ec	2	Prin. of Economics	3
or Bc	7	Chemistry		Ms*	6	Elements of College Math.	3
Eh	1	Freshman Composition	3	Pe	2	Physical Education	0
Ms*	5	Elements of College Math.	3			Electives	2
Pe	1	Physical Education	0				
		Electives	2				
			15				15

* Ms 4 and 12 may be substituted

Agricultural Engineering

FALL SEMESTER				SPRING SEMESTER			
		Subject	Hours			Subject	Hours
LSA	1	University Life	0	Ch	14	Chemistry Principles	4
Ch	13	Chemistry Principles	4	Eh	1	Freshman Composition	3
Ge	1	Introduction to Engrg. Design	2	Ge	2	Introduction to Engrg. Design	2
Ge	5	Orientation	0	Ms	27	Calculus	4
Ms	12	Anal. Geom. & Cal.	4	Pe	2	Physical Education	0
Pe	1	Physical Education	0	Ge	6	Orientation	0
Ps	1	General Physics	4	Ps	2	General Physics	4
			14				17

Agricultural Mechanization

FALL SEMESTER				SPRING SEMESTER			
Subject			**Hours**	**Subject**			**Hours**
LSA	1	University Life	0	Ec	2	Prin. of Economics	3
Ec	1	Prin. of Economics	3	Ge	2	Introduction to Engineering Design	2
Ge	1	Introduction to Engineering Design	2	Ps	2a	General Physics	4
Eh	1	English Composition	3	Pe	2	Physical Education	0
Ms	4	Algebra and Trigonometry	3			Electives	6
Ps	1a	General Physics	4				
Pe	1	Physical Education	0				
			15				15

Animal and Veterinary Sciences—Plant and Soil Sciences

FALL SEMESTER				SPRING SEMESTER			
Subject			**Hours**	**Subject**			**Hours**
LSA	1	University Life	0	Ch	12 or 14	Chemistry	4
Ch or	11 13	Chemistry	4	Pe	2	Physical Education	0
Eh	1	Freshman Composition	3	S	2	Soils	4
Ms	4*	Algebra and Trigonometry	3	or Zo	4	Animal Biology	
Pe	1	Physical Education	0			Electives	7
Bt or Zo	1 3	General Botany / Animal Biology	4				
		Electives	1				
			15				15

* Ms 5 and 6, or Ms 12 may be substituted

Biological Sciences

(Bacteriology-Biochemistry-Biology-Botany-Entomology)

FALL SEMESTER				SPRING SEMESTER			
Subject			**Hours**	**Subject**			**Hours**
LSA	1	University Life	0	Ch	12 or 14	Chemistry	4
Ch or	11 13	Chemistry	4	Ms	12	Anal. Geom. & Cal.	4
Eh	1	Freshman Composition	3	Pe	2	Physical Education	0
Ms	4	Algebra & Trigonometry	3	Bt	2	Plant Kingdom or	4
Pe	1	Physical Education	0	Zo	4	Animal Biology	
Bt or Zo	1 3	General Botany or Animal Biology	4			Elective	3
			14				15

Forestry and Wildlife

FALL SEMESTER				SPRING SEMESTER			
Subject			**Hours**	**Subject**			**Hours**
or	13			Ch	12 or 14	Chemistry	4
Ch	11	Chemistry	4	Ge	12	Forestry Drawing	2
Eh	1	Freshman Composition	3	Fy	2	Intro. to Forest Resources	2
Fy	1	Intro. to Engrg. Design	2				

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Fy	1	Intro. to Forest Resources	2	Bt	1	General Botany	
Ms	4*	Algebra & Trigonometry	3			or	4
Bt	1	General Botany		Zo	3	Animal Biology	
		or	4	Pe	2	Physical Education	0
Zo	3	Animal Biology				Electives	5
Pe	1	Physical Education	0				
			18				17

* Ms 12 may be substituted.

Departmental and School Majors

AGRICULTURAL AND RESOURCE ECONOMICS

PROFESSORS METZGER, PERRY, PLOCH, PULLEN; ASSOCIATE PROFESSORS DELPHENDAHL, DUNHAM*, HARLAN, JOHNSTON, KROFTA, WING; ASSISTANT PROFESSORS HYATT*, KING, TOBEY; INSTRUCTOR GAMACHE

The Department of Agricultural and Resource Economics offers a curriculum leading to the B. S. degree in agricultural and resource economics, with emphasis in agricultural business management and marketing, and resource and production economics. Majors in sociology of rural life and international affairs are also available. The department's program is designed to develop abilities to handle managerial responsibilities in the economic and social aspects of the food and fiber industries and allied fields, and the development of human and natural resources. The program provides a broad education in agricultural business, economics, and rural sociology.

Areas of instruction include the business and economic aspects of production, with emphasis on the economic use and management of capital, labor, land, and water resources; the business aspects of marketing, with emphasis on pricing, financing, merchandising, work simplification, quality control, and consumption; economics related to development of area resources; and social and human factors associated with food production processing, distribution, consumption, and community development; and foreign languages and the political, legal, and economic aspects of international relations. In addition, economic training is complemented by a comprehensive, integrated program of courses in the life sciences, other social sciences, communication, arts and humanities.

Employment opportunities exist in food and agricultural business such as manufacturing and processing firms, wholesale and retail distribution firms, insurance and credit agencies, cooperatives, feed, fertilizer, and farm supply companies, federal and state governments, and colleges and universities; international organizations and international business and agriculture.

The B.S. degree in agricultural and resource economics requires satisfactory completion of at least 120 degree hours at an accumulative grade-point average of not less than 1.80 in a course of study which conforms to the following curriculum:

*On leave of absence 1969-70.

Curriculum for Agricultural and Resource Economics

(Except Sociology of Rural Life and International Affairs)

Required Courses		Credit Hours	Minimum Degree Hours Required
A. ORIENTATION			0
B. BASIC SCIENCES			15
Bc 7 or Ch 11	Fundamentals of Chemistry or General Chemistry	4	
Bt 1	General Botany	4	
Zo 3 or AnP 135	Animal Biology, or Anatomy of Domestic Animals	3 (4)	
Ms 5 & 6 or 4 & 12	Elements of College Mathematics or Algebra & Trigonometry & Anal. Geom. & Calculus	4 (7)	
C. COMMUNICATIONS			9
Eh 1	Freshman Composition	3	
Eh 7 or Eh 17	Advanced Composition or Expository Writing	3	
Sh 1	Intro. to Oral Communication	3	
D. HUMANITIES AND SOCIAL SCIENCES			18
	Electives* (Minimum of 2 courses in each—humanities & social sciences.)	18	
E. LIFE SCIENCES AND AGRICULTURE			12
S 2	Soils	3	
	Electives**	9	
F. BUSINESS AND ECONOMICS			18
Ec 1 & 2	Principles of Economics	6	
Ba 9	Principles of Accounting	3	
Ec 153	Money and Banking	3	
	Electives (Any Ba or Ec courses)	6	
G. AGRICULTURAL AND RESOURCE ECONOMICS			26
ARE 24	Sociology of Rural Life	3	
ARE 154	Introduction to Production Economics	3	
ARE 159	Agricultural Business Management	3	
ARE 165	Food and Fiber Marketing	3	
ARE 168	Price Analysis and Forecasting	3	
ARE 171	Land Resource Economics	3	
ARE 193, 194	Seminar	2	
	Electives (Any ARE course except ARE 48)	6	
H. RESEARCH METHODS AND STATISTICS			6
Ms 19	Principles of Statistical Inference	3	
Sy 120	Methods of Social Research	3	
I. FREE ELECTIVES			16
	Any course in the University for which the student is qualified		
Minimum Degree Hours Required for Graduation			120

* Choose from the following fields: Art or Music, Literature, Psychology, Philosophy, Political Science, Sociology.

** Any courses in the College of Life Sciences and Agriculture, except Agricultural and Resource Economics courses, approved by adviser.

Curriculum for Sociology of Rural Life

Students who major in rural sociology take the same program as major students in agricultural and resource economics except for the requirements listed under section F (18 hours) and G (26 hours). The following 44 credit hours substitute for section F and G:

Ec 1	Principles of Economics	3
ARE 48	Principles of Agricultural Economics	3
ARE 24	Sociology of Rural Life	3
ARE 42	World Population Resources	3
ARE 124	Contemporary Rural Problems	3
ARE 129	The Individual and the Community	3
ARE 150	Human Factors in Resource Development	3
ARE 81	Agriculture & Economic Growth	3
ARE 193, 194	Seminar	2
Py 1, 2	General Psychology	6
Py 130	Social Psychology	3
Sy 3/4 or	Introduction to Sociology	
	or	6
Ay 1/2	Introduction to Anthropology	
	Electives (Sociology or Anthropology)	3
		44

The student, after consultation with his adviser, should declare to the department head his intention to pursue the rural sociology major. This should be done at the time of preregistration for the fall semester of the sophomore year.

Curriculum for International Affairs

Required Courses		Credit Hours	Minimum Degree Hours Required
Orientation			0
BASIC SCIENCES			18
Bc 7 or Ch 11	Fundamentals of Chemistry or General Chemistry	4	
Bt 1	General Botany	4	
Zo 3	Animal Biology	4	
Ms 5 & 6	Elements of College Mathematics	6	
MODERN FOREIGN LANGUAGE			14
	First Year	8	
	Second Year	6	
COMMUNICATIONS			9
Eh 1	Freshman Composition	3	
Eh 7 or 17	Second-Year Composition or Expository Writing	3	
Sh 1	Intro. to Oral Communication	3	
HUMANITIES AND SOCIAL SCIENCES			21
Hy 5 or 6	History of Western Europe	3	
Pol 1 & 2	Introduction to Government	3	
Pol 173 & 174	International Relations	6	
Pol 187	International Law	3	
Pol 188	International Organization	3	
LIFE SCIENCES AND AGRICULTURE			8
S 2	Soils	3	
	Electives	5	

BUSINESS AND ECONOMICS			18
Ec 1 & 2	Principles of Economics	6	
Ba 9	Principles of Accounting	3	
Ec 137	Comparative Economic Systems	3	
Ec 139 & 140	International Trade and Commercial Policy	6	
AGRICULTURAL AND RESOURCE ECONOMICS			26
ARE 24	Sociology of Rural Life	3	
ARE 42	World Population Resources	3	
ARE 150	Human Factors in Resource Development	3	
ARE 154	Introduction to Production Economics	3	
ARE 165	Food and Fiber Marketing	3	
ARE 168	Price Analysis and Forecasting	3	
ARE 171	Land Resource Economics	3	
ARE 186	World Policies for Agriculture	3	
ARE 193 & 194	Seminar	2	
RESEARCH METHODS AND STATISTICS			6
Ms 19	Principles of Statistical Inference	3	
Sy 120	Methods of Social Research	3	
ELECTIVES			4
Hy 5 or 6	History of Western Europe	3	
	Other	1	
Minimum Degree Hours Required for Graduation			**120**

Courses in Agricultural and Resource Economics (ARE)

48. Principles of Agricultural Economics—A study of economic principles applied to the business firm, with consideration given to production, marketing, use of human and natural resources, and governmental policy. *Rec* 3, *Cr* 3. Not open to ARE majors. MR. WING

81. Agriculture and Economic Growth—Principles and factors of economic development. Resource allocation in emerging nations. The role of agriculture in developing economies. Effect of transition to market economy on social and economic institutions. Function of national economic planning. *Rec* 3, *Cr* 3. MR. DELPHENDAHL, MR. HARLAN

154. Introduction to Production Economics—The application of economic relationships and principles of problems of resource allocation at the firm level. Prerequisite: Ec 1 & 2 or ARE 48. *Rec* 3, *Cr* 3. MR. KROFTA

‡***159. Agricultural Business Management***—Discussion of the management principles and procedures applicable to agricultural businesses. Prerequisite: ARE 48 or Ec 1 and Ec 2; and Ba 9. *Rec* 3, *Cr* 3. MR. WING

†***164. Statistical Quality Control***—Distribution and sampling theories with application to methods of process control and acceptance inspection. Prerequisite: permission of instructor. *Rec* 2, *Lab* 2, *Cr* 3. MR. PERRY

165. Food and Fiber Marketing—Economic principles applied to marketing structures, services and agencies; analysis of costs and efficiencies; impact of industry organization and government. Prerequisite: Ec 1 & 2. *Rec* 3, *Cr* 3. MR. KING

†***167. Food Distribution Management***—The management approach to marketing. Includes areas of decision making such as marketing organization, products, distribution policies, pricing, advertising and personal selling. Firm visits. Lab fee $5. Prerequisite: Ec 1 & 2. *Rec* 2, *Lab* 2, *Cr* 3. MR. DUNHAM

†***168. Price Analysis and Forecasting***—The consideration of supply, demand, and elasticity in affecting food prices; their application to price discrimination, future markets, and price programs; and the use of quantitative techniques in price forecasting. Prerequisite: Ec 1 & 2 and Ms 19 or permission of instructor. *Rec* 3, *Cr* 3. MR. PERRY

171. Land Resource Economics—Principal economic and institutional factors affecting man in his use of land and resources; supply, demand, and future requirements; input-output relationships, benefit cost analysis; planning for more efficient use of resources. Prerequisite: Ec 1 & 2. *Rec* 3, *Cr* 3. MR. DELPHENDAHL

†***186. World Policies for Agriculture***—Analysis of national and international policies affecting food production and distribution. Areas of competition, changes in comparative advantage. Interrelationship of national and international policies. Current programs for international cooperation. Prerequisite: Ec 1 & 2. *Rec* 3, *Cr* 3. MR. DELPHENDAHL

193. 194. Seminar—Discussion of current economic problems. Prerequisite: seniors and graduates. *Rec* 1, *Cr* 1. MR. METZGER

199. Problems and Readings in Agricultural and Resource Economics—Analysis of and readings on current problems in agricultural and resource economics, and rural sociology. Prerequisite: permission of instructor. *Rec* 2, *Cr* 2. STAFF

ARE/Ec 225. Mathematical Economics — Advanced economic theory presented mathematically. Prerequisites: Ec 210, Ec 211, Ec 180 or permission of instructor. *Cr* 3.

ARE/Ec 230. Econometrics — An introduction to economic concepts and relationships expressed in statistical terms. Major emphasis will be given to economic models related to demand, supply, production and cost functions; input-output analysis and other models will also be considered. Prerequisite: Ms 6 or 12, Ms 19, Ec 173 or permission of instructor. *Rec* 3, *Cr* 3.

‡***272. Resource Use and Economic Growth***—Resource utilization and economic growth in retrospect. Importance of resources. Theories, measurements of economic development. Public policies and planning for resource development. Prerequisite: ARE 171 or permission of instructor. *Rec* 3, *Cr* 3. MR. DELPHENDAHL

304. Marketing Theory and Concepts—Economic theory underlying the policies of marketing firms; the details of current marketing problems and current market practices for selected commodities. Prerequisite: ARE 166. *Rec* 3, *Cr* 3. MR. KING

307. Production Economics—The principles of optimum resource allocation applied to agricultural businesses under perfect knowledge and with consideration of uncertainties. The use of linear programming as a tool for attaining optimum resource allocation. Prerequisite: ARE 154, Ms 19 or permission. *Rec* 3, *Cr* 3. MR. KROFTA

359. Research Methods in Agricultural and Resource Economics—Nature of economic and social analysis; scientific objectivity; individual and public problems; formulation of hypotheses and models; empirical techniques; evaluation of current research procedures. Prerequisite: permission of instructor. *Rec* 3, *Cr* 3. MR. TOBEY

399. Graduate Thesis—*Cr Ar.* STAFF

Courses in Sociology of Rural Life (ARE)

24. Sociology of Rural Life—Significance of rural society in American culture. The impact of forces of change, including population movement. The significance of changes in the institutions of family, religion, education, and stratification. Course same as Sy 24. *Rec* 3, *Cr* 3. MR. PLOCH

42. World Population Resources—An introductory course with emphasis on size and distribution of the population resource in relation to other resources essential to life. Trends in growth and migration will be analyzed. Possible alleviation of problems through policy formulation will be discussed. *Rec* 3, *Cr* 3. MR. GAMACHE

124. Contemporary Rural Problems—A problem-oriented, class participation course focusing on the trends taking place in contemporary rural society. Includes rural population displacement and mobility, poverty, industrialization; consequent changes in occupational composition, and related changes. Prerequisite: ARE/Sy 24 or equivalent. *Rec* 3, *Cr* 3. MR. PLOCH

†***129. The Individual and the Community***—Analysis of the functioning and structure of the community. Emphasis on ways in which individuals and groups are affected by community dynamics. Group process, leadership, and development are stressed. Community project. Prerequisite: ARE/Sy 24 or Sy 126 or permission. *Rec* 3, *Cr* 3. MR. PLOCH

†***150. Human Factors in Resource Development***—Methods of social change. Community and individual resistances to, and acceptance of, development programs. Consequences of development for community social systems. The development as an interactive force in the community. Prerequisite: ARE 24/Sy 4 or permission. *Rec* 3, *Cr* 3. MR. PLOCH

Graduate Work in Agricultural and Resource Economics

The degree of master of science in agricultural and resource economics is offered with an opportunity for specialization in agricultural business management, food distribution and marketing, production economics, resource economics, resource utilization, and sociology of rural life. Students may select a minor area of study in a related subject matter field. Candidates will be encouraged to enroll in graduate level courses in the College of Business Administration, and the College of Life Sciences and Agriculture and in the Departments of Economics, Mathematics and Astronomy, and Sociology and Anthropology.

The degree of master of agricultural and resource economics also is offered. Candidates for this degree are not required to write a thesis, but must meet all other requirements of the master of science degree.

AGRICULTURAL ENGINEERING

PROFESSORS SMITH, RHOADS, KLINGE; ASSOCIATE PROFESSORS HUFF, ROWE, SOULE, WILLIAMS; INSTRUCTORS ELLIS, GRAY

The Agricultural Engineering Department offers major work leading to the degree of bachelor of science in agricultural engineering and to the degree of bachelor of science in agricultural mechanization.

UNIVERSITY OF MAINE

B.S. in Agricultural Engineering

The Agricultural Engineering curriculum combines study in the biological sciences and the physical sciences with mathematics and engineering to provide a unique background for solving engineering problems associated with agriculture.

The basic curriculum is strengthened by elective options which permit the student to specialize in one of four areas according to his interests and needs. Areas of specialization are: (1) Design and application of machinery and power units for the agricultural industry; (2) Design and application of food and fiber processing systems; (3) Design of agricultural structures; and (4) Soil and water conservation engineering. Electives in engineering and the life sciences aid in providing a broad base of knowledge for engineering practice.

Agricultural engineers are in great demand because of the rapidly expanding world population, a rising demand for higher standards of living, and limited natural resources. Employment opportunities are as diverse as the agricultural industry itself. Graduates in agricultural engineering may be employed as design engineers by machinery and farmstead systems manufacturers; as sales engineers by machinery, food or chemical companies; as research engineers by industry, government or state experiment stations or in teaching or extension positions by universities. Some practice as consulting engineers. An increasing number of opportunities for foreign service are opening up.

The curriculum in Agricultural Engineering is a joint responsbility of the College of Technology and the College of Life Sciences and Agriculture.

This degree requires satisfactory completion of at least 129 degree hours at an accumulative grade point average of not less than 1.80 in a course of study which conforms to the following curriculum:

Curriculum for the B.S. Degree in Agricultural Engineering

Freshman Year. See Page 220

		Credit Hours	Minimum Degree Hours Required
A. ORIENTATION			
LSA 1	University Life		0
B. AGRICULTURAL ENGINEERING			25
AE 55	Materials in Ag. Eng.	3	
AE 80	Seminar	0	
AE 82	Intro. to Ag. Eng.	2	
AE 83	Special Problems in Ag. Eng.	1	
AE 84	Special Topics in Ag. Eng.	3	
AE 160	Agr. Machinery	3	
AE 163	Farm Structures	3	
AE 165	Soil and Water Eng.	4	
AE 167	Agricultural Power	3	
AE 169	Agr. Processing	3	
C. ENGINEERING			27
Ge 1	Intro. to Design	2	
Ge 2	Intro. to Design	2	
Gc 7	Computer Programming	2	
Me 33	Thermodynamics	3	
Me 53	Statics and Kinematics	4	
Me 54	Kinetics	4	
Me 59	Fluid Mechanics	3	
Ee 41	Elementary Circuits	3	

D.	BASIC SCIENCES			32
	Ch 13	Chemistry Principles	4	
	Ch 14	Chemistry Principles	4	
	Ms 12	Analytical Geom. and Calculus	4	
	Ms 27	Calculus	4	
	Ms 28	Analytical Geom. and Calculus	4	
	Ms 29	Calculus & Diff. Eq.	4	
	Ps 1	General Physics	4	
	Ps 2	General Physics	4	
E.	AGRICULTURAL AND BIOLOGICAL SCIENCE			10
	Bt 1	General Botany	4	
		or		
	Zo 3	Animal Biology		
	S 2	Soils	3	
		Electives	3	
F.	COMMUNICATIONS			8
	Eh 1	English Composition	3	
	Sh 1	Intro. to Oral Communications	3	
		Electives	2	
G.	HUMANITIES AND SOCIAL SCIENCES			15
	Minimum of two semester courses required in each.			
H.	OTHER			12
	Ge 5	Orientation	0	
	Ge 6	Orientation	0	
	Pe 1	Physical Education	0	
	Pe 2	Physical Education	0	
		Technical Electives	7	
Minimum Degree Hours for Graduation				**129**

LSA 1 University Life; Ge 5/6 Orientation; AE 80 Senior Seminar or AE 81 Departmental Seminar are required each semester.

Students transferring to University of Maine from the University of Massachusetts, New Hampshire, Rhode Island or Vermont under the Regional Program should check the bulletins of those institutions for the first two years in Agricultural Engineering.

Graduate Work in Agricultural Engineering

The degrees of master of science (Agricultural Engineering) and master of engineering (Agricultural Engineering) are offered with options for specialization in soil and water engineering, farm structures, agricultural power and machinery, and electric power and processing.

Several research assistantships are available each year. Incumbents devote half time to research on approved projects of the Agricultural Experiment Station.

B.S. in Agricultural Mechanization

The curriculum in Agricultural Mechanization provides training in specific aspects of engineering technology and couples this with training in business, economics, and agricultural subjects. It is designed to prepare graduates for work in the application of equipment and systems to food production, processing and handling businesses either as field representatives of industrial concerns or as management personnel on mechanized production units.

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Graduates find employment as technical sales representatives for machinery companies, farm service advisers for electric power companies, field advisers for fuel companies, machinery managers on corporation farms, field managers for food processors, and as agricultural contractors. Positions are also available with equipment companies in the fields of product development and product education.

This degree requires satisfactory completion of at least 120 degree hours at an accumulative grade point average of not less than 1.80 in a course of study which conforms to the following curriculum:

Curriculum for Agricultural Mechanization

Freshman Year. See Page 221

		Credit Hours	Minimum Degree Hours Required
A. ORIENTATION			0
LSA 1	University Life	0	
B. AGRICULTURAL MECHANIZATION PROFESSIONAL COURSES			21
AE 20	Principles of Agricultural Mechanization	3	
AE 31	Field Machinery Management	3	
AE 32	Farm Building & Equipment	3	
AE 34	Instrumentation	3	
AE 35	Soil Water Control	3	
AE 36	Farm & Forestry Power	3	
AE 83	Spec. Prob. in A. E.	3	
AE 84	Spec. Topics in A. E.	3	
C. PROFESSIONAL FIELD SUPPORTING COURSES			34
Ec 1	Principles of Economics	3	
Ec 2	Principles of Economics	3	
Ba 9	Principles of Accounting	3	
Fs 101	Food Processing Industry	3	
	Electives (12 hours must be in LSA courses)	22	
D. BASIC SCIENCES AND ENGINEERING			25
Ge 1	Introduction to Eng. Design	2	
Ge 2	Introduction to Eng. Design	2	
Ms 4	Algebra & Trigonometry	3	
Ms 19	Principles of Statistical Inference	3	
Ms 169	Computer Programming	3	
Ps 1a	General Physics	4	
Pe 2a	General Physics	4	
Ch 11	General Chemistry	4	
E. AGRICULTURAL AND BIOLOGICAL SCIENCES			16
Bt 1	General Botany	4	
AnV 135	Anatomy of Domestic Animals	3	
S 2	Soils	3	
	Electives	6	
F. COMMUNICATIONS			9
Eh 1	Freshman Composition	3	
Sh 1	Introduction to Oral Communication	3	
	Elective	2	
G. HUMANITIES AND SOCIAL SCIENCES			15
	Minimum of two semester courses in each		
H. OTHER			0
Pe 1	Physical Education	0	
Pe 2	Physical Education	0	
Minimum Degree Hours Required for Graduation			**120**

Courses in Agricultural Engineering (AE)

Courses numbered below 50 or 101-150 are intended primarily for the Agricultural Mechanization curriculum or as service courses for students in other departments of the College of Life Sciences and Agriculture.

20. Principles of Agricultural Mechanization — Study of the principles involved in farm mechanization; measurement techniques; problem solving, functional analysis and principles of agricultural machines, structures and power sources. Prerequisite: Ms 4; *Rec* 2, *Lab* 2, *Cr* 3. MR. SMITH

31. Field Machinery Management—Development of machinery systems for integrating farm field operations into food and fiber production processes; selection and use of machines and applications of power to these field operations. Prerequisite: Ms 4, Ae 20, or permission of instructor. *Rec* 2, *Lab* 2, *Cr* 3. MR. SOULE

32. Farm Buildings and Equipment — Consideration of environmental control; methods and materials of construction; functional requirements and system economics of production, processing and storage buildings. Prerequisite: Ms 4. *Rec* 2, *Lab* 2, *Cr* 3. MR. WILLIAMS

†***34. Instrumentation***—A study of the basic principles and applications of instruments for measuring and controlling such phenomena as temperature, force, pressure, humidity, moisture content and flow rate. Applications to agriculture and biological sciences are stressed. Prerequisite: Ps 6. *Rec* 2, *Lab* 2, *Cr* 3. MR. ROWE

35. Soil Water Control—Field surveying, planning, layout and construction of soil and water control structures such as farm ponds, drainage systems, irrigation systems and soil erosion control systems. *Rec* 2, *Lab* 3, *Cr* 3. MR. KLINGE

36. Farm and Forestry Power—Principles of construction, operation, and maintenance of internal combustion engines, tractors, and related equipment. Selection, application, and management of power equipment in farm and forestry activities. Prerequisite: Ms 4; *Rec* 2, *Lab* 2, *Cr* 3. MR. HUFF

37. Agricultural Engineering for Developing Countries—Principles and methods of improving agricultural and community facilities in rural and undeveloped areas, covering water supply and irrigation, electrification, improvised roads and bridges, light structures, power units, field machines, and sanitation. Prerequisite: Ms 4. *Rec* 2, *Lab* 3, *Cr* 3. MR. RHOADS, MR. SMITH

55. Materials in Agricultural Engineering—An introduction to physical and rheological properties of structural and biological materials useful in agricultural design and application. Prerequisite: Ps 2 or permission of instructor. *Rec* 2, *Lab* 2, *Cr* 3. MR. SOULE

79. Seminar—Recent literature, developments and problems in the field of agricultural engineering. *Rec* 1, *Cr* 0. MR. RHOADS

80. Senior Seminar—Problems associated with professionalism and the first employment of the young agricultural engineer. *Rec* 1, *Cr* 0. MR. SMITH

81. Departmental Seminar—Presentation and discussion of current developments and problems that affect agricultural engineering and agricultural engineers. *Rec* 1 (monthly), *Cr* 0. STAFF

82. Introduction to Agricultural Engineering — An introduction to engineering experimentation involving biological material. For sophomores majoring in agricultural engineering. *Rec* 1, *Lab* 2, *Cr* 2. MR. HUFF

83, 84. Special Problems in Agricultural Engineering—*Cr Ar.* STAFF

160. Agricultural Machinery—Analysis of functional and power requirements, capacity, and economics of agricultural machines. Principles of design; laboratory and field test. Prerequisite: Me 51. *Rec* 2, *Lab* 3, *Cr* 3. MR. SOULE

163. Farm Structures Design—Structural design and environmental control in production, processing and storage buildings; consideration of functional requirements, system economics and methods and materials of construction. Prerequisite: Me 51. *Rec* 2, *Lab* 3, *Cr* 3. MR. WILLIAMS

‡***164. Instrumentation and Control Systems***—Analysis of dynamic measurement and control systems. Laboratory problems include temperature, force, moisture content, strain, and fluid flow measurements involving physical and biological systems. Ps 2 and Ms 28. *Rec* 2, *Lab* 2, *Cr* 3. MR. ROWE

165. Soil and Water Engineering—Study of rainfall and runoff, flood control, land clearing techniques, and water resources engineering. Design of erosion control structures, small earth dams and farm reservoirs, drainage and irrigation systems. Prerequisite: Ce 26 or Me 59. *Rec* 3, *Lab* 3, *Cr* 4. MR. KLINGE

167. Agricultural Power — Tractor power units, construction, operating principles, testing and rating; vehicle mechanics as applied to tractors and other cross country vehicles; farm electrification; new energy sources and applications for agriculture. Prerequisite: Me 33. *Rec* 2, *Lab* 3, *Cr* 3. MR. HUFF

169. Agricultural Process Engineering—Unit operations and their applications as related to agricultural processing and processing equipment. Prerequisite: Me 33 and 59 or Ce 26 (may be taken concurrently). *Rec* 2, *Lab* 3, *Cr* 3. MR. RHOADS

380. Graduate Seminar—*Rec* 1, *Cr* 1. STAFF

383/384. Problems in Agricultural Engineering—*Cr Ar.* STAFF

399. Graduate Thesis—*Cr Ar.* STAFF

ANIMAL AND VETERINARY SCIENCES

PROFESSORS MUSGRAVE, BIRD, CHUTE, DICKEY, GERRY, LEONARD, WITTER; ASSOCIATE PROFESSORS APGAR, BRUGMAN, HARRIS, HOOVER, O'MEARA, GERSHMAN, VAN DER HEIDE; ASSISTANT PROFESSORS BLAMBERG, COCK, GOATER, GRAY; LECTURERS CORDELL, DAS, DEHOFF, FOX, HOFSTRA, HOHN, SAWIN, SUTER, TASHJIAN

The Animal Sciences curriculum is designed to provide a broad biological training as well as a thorough understanding of the anatomy, behavior, breeding, genetics, management, nutrition and physiology of large animals, poultry and laboratory animals.

Because a basic knowledge in animal sciences is fundamental to successful work in many job situations, the curriculum offers a wide choice of electives in order that students may adapt their courses of study to meet specific professional interests or needs. Through the proper use of electives, students can prepare for admission to graduate school or veterinary college, teaching sciences in secondary schools, pursuing technical sales and service work in the animal and poultry industries, careers as laboratory animal technicians, or developing animal production enterprises such as dairy, poultry, or livestock farming.

Courses in Animal Pathology are offered to support the curriculum in the department and the curriculum in Wildlife Management. They also serve as elective opportunities for students in other agricultural sciences, agricultural engineering, and zoology. This department also administers the Pre-Veterinary Science program (see page 270).

Superior students should consider continuing their studies at the graduate level. The Department of Animal and Veterinary Sciences offers the master of science degree in animal science for a program of study in animal nutrition, animal physiology, or animal breeding. The doctor of philosophy degree may be earned in animal nutrition.

Curriculum for the B.S. Degree in Animal and Veterinary Sciences

Freshman Year. See Page 221

		Credit Hours	Minimum Degree Hours Required
A. ORIENTATION			0
B. ANIMAL AND VETERINARY SCIENCES			32
AnV 45	Animal Science	3	
AnV 155-156	Nutrition	6	
AnV 160	Animal Genetics & Breeding	3	
Electives in Animal & Veterinary Sciences		20	
C. BASIC SCIENCES*			20
Ch 11-12	General Chemistry or	8	
	Bc 7-8 Biochem.	8	
Zo 3-4	Animal Biology	4	
	Mathematics		
D. LIFE SCIENCES AND AGRICULTURE			12
Electives in Life Sciences and Agriculture		12	
E. COMMUNICATIONS			8
Eh 1	Freshman Composition	3	
AnV 163-164	Seminar	2	
Electives in Eh, Jl, Sh or Languages (See LS&A General Req'ts)		3	
F. HUMANITIES AND SOCIAL SCIENCES			15
Choose a minimum of 2 courses in the Humanities and Social Sciences			
G. FREE ELECTIVES			33
Minimum Degree Hours Required for Graduation			**120**

* A student desiring to pursue graduate work should select at least 32 credit hours in the basic sciences in consultation with his adviser.

** A student preparing for a career in the animal production industries should select at least 12 credit hours in marketing, business and economics in consultation with his adviser.

Courses in Animal and Veterinary Sciences (AnV)

43. Tropical Agriculture—A consideration of the characteristics and problems of the soils, plants, and animals of the tropics. Programs and methods for stimulating their potential productivity will be explored. *Rec* 3, *Cr* 3.

45. Animal Science—Fundamental principles of the animal sciences, including animal genetics, breeding systems, the physiology of reproduction, animal nutrition and the physiology of lactation. *Rec* 3, *Cr* 3. MR. MUSGRAVE

46. Dairy Cattle Technology—The application of breeding, feeding, housing, selection, care, records, breed association programs and recent research find-

ings to herd management. The laboratory is devoted to problems in and techniques of dairy cattle management. Field trip fee $4. Prerequisite: AnV 45. *Rec* 2, *Lab* 2, *Cr* 3. MR. LEONARD

48. Livestock Management—The selection, breeding, feeding, care and management of beef cattle, sheep, and swine. Prerequisite: AnV 45. *Rec* 3, *Lab* 2, *Cr* 4. MR. BRUGMAN

‡***49. Livestock and Poultry Feeding***—A course designed to acquaint the student with the nutritional value of various feedstuffs, the dietary requirements of animals and poultry, and the ingredients used to fulfill the requirements. *Rec* 3, *Cr* 3. MR. LEONARD, MR. GERRY

65. Meat Technology—The basic science of meat and meat processing, packing house methods and cutting of meat. *Rec* 2, *Lab* 2, *Cr* 3. MR. BRUGMAN, MR. GERRY

66. Dairy Technology—Studies in the composition and properties of milk and milk products, and common dairy processes such as pasteurization, homogenization and quality control methods. Testing dairy products for fat, solids, adulteration and acidity. *Rec* 2, *Lab* 2, *Cr* 3. MR. COCK

85. Poultry Technology—The science of the biology, breeding, feeding, incubation, and diseases of the domestic fowl, and the housing, management, and business practices of the table egg, hatching egg, and broiler industries. Field trip fee $5. *Rec* 2, *Lab* 2, *Cr* 3. MR. HARRIS

135. Anatomy of Domestic Animals—Comparative anatomy of domestic mammals and birds emphasizing gross and histological features of the parts involved in major physiological processes, meat uses and diseases. *Rec* 2, *Lab* 2, *Cr* 3. MR. WITTER, MR. CHUTE

136. Physiology of Domestic Animals—Special emphasis is placed on comparative features, especially of the circulatory, respiratory, digestive, and urogenital systems of domestic mammals and birds. Prerequisite: AnV 135 or equivalent. *Rec* 3, *Cr* 3.

137. Animal Diseases—Principles of herd health programs. The pathology, control, and prevention of important diseases and parasites of domestic animals. Juniors and seniors. Prerequisite: AnV 135 or permission. *Rec* 3, *Cr* 3. MR. WITTER

140. Poultry Diseases—Principles of hygiene and sanitation applied to the prevention and control of the diseases of poultry, including a detailed consideration of the pathological processes involved in the common diseases. Prerequisite: permission of instructor. *Rec* 3, *Cr* 3. MR. CHUTE

‡***142. Physiology of Reproduction***—The comparative function of the organs of reproduction in domestic animals. Special emphasis on the areas that are commonly associated with infertility and disease. Offered during spring of even years. Prerequisite: AnV 135, AnV 136 or with permission. *Rec* 2, *Lab* 2, *Cr* 3. MR. WITTER

144. Disease and Parasite Control **(in Wildlife)**—Known infectious and parasitic diseases of game and fur-bearing animals, zoonoses, emphasizing preventive and control measures and practice in autopsy and diagnostic techniques. Wildlife majors. *Rec* 2, *Lab* 2, *Cr* 3. MR. WITTER

150. Animal Mycopathology—Fungi of avian and mammalian importance

including isolation, identification, pathogenicity indicators, tissue invasion, toxin assay and laboratory safety. Prerequisite: By 128 or equivalent. *Rec* 2, *Lab* 2, *Cr* 3.
MR. O'MEARA

151. 152. Problems in Animal Pathology—*Cr Ar.*

153. 154. Problems in Dairy Science—Prerequisite: permission. *Cr Ar.*
STAFF

155. Animal Nutrition—Principles of nutrition, methods of experimentation and discussion of nutritional balances. Prerequisite: Zo 4, Ch 12. *Cr* 3.
MR. DICKEY

156. Applied Animal Nutrition—A study of the nutrient requirements of livestock and avian species. The nutritive value and characteristics of feedstuffs are studied as well as methods of formulating balanced nutrient intakes. Prerequisite: AnV 155. *Rec* 2, *Lab* 2, *Cr* 3. MR. HOOVER, MR. GERRY

157. 158. Problems in the Animal Sciences—Special study of research problems within the animal science field. *Cr Ar.* STAFF

160. Animal Genetics and Breeding — The principles of genetics. The transmission and expression of hereditary factors in animal breeding. Prerequisite: Zo 4. *Rec* 3, *Cr* 3. MR. DICKEY

161. Advanced Animal Breeding—The inheritance of the commercially valuable characteristics of animals. Mating systems and their effects. Progeny testing, selection indices and other methods to increase intensity and accuracy of selection. Prerequisite: AnV 160 or equivalent. *Rec* 3, *Cr* 3. MR. DICKEY

163. 164. Seminar—Preparation and presentation of papers dealing with research in the animal sciences. *Cr* 1. MR. COCK AND STAFF

170. Physiology of Lactation—A detailed study of the anatomy, development and function of the mammary gland. The biochemistry and physiology of milk secretion and udder evacuation. Prerequisite: Zo 4, Bc 122. *Cr* 3. MR. APGAR

172. Endocrinology—A detailed study of the animal endocrine system and functional relationships of each of the endocrine glands to growth, reproduction and lactation. Prerequisite: Zo 4, Anv 136. *Rec* 3, *Lab* 2, *Cr* 4. MR. MUSGRAVE

175. Behavior of Domestic Animals—A survey of factors encompassing the fundamentals of behavior in domestic animals, including interrelationships of behavior and domestication. Special attention is given to social, mating, and feeding behavior of several mammalian and avian species. Prerequisite: Zo 4, Bc 122. *Rec* 3, *Lab* 2, *Cr* 4. MR. APGAR

‡***182. Avian Physiology***—Anatomy and physiology of the fowl with emphasis on the physiology of reproduction; special attention will be given to the current literature. Prerequisite: AnV 136 or permission of the instructor. *Rec* 2, *Lab* 2, *Cr* 3 MR. HARRIS

186. Bioassay—A study of various bioassay techniques and associated problems illustrated by laboratory exercises. Prerequisite: permission of instructor. *Rec* 1, *Lab* 4, *Cr* 3. MR. BIRD

200. Advanced Animal Pathology—The gross and histopathology of the reaction of domestic animals to nutritional disorders and various etiologic agents, such as bacteria, viruses, fungi, parasites, poisons, and toxins. Prerequisite: AnV 35, 36, Zo 51, Bc 60 or equivalent courses. *Rec* 2, *Lab* 2, *Cr* 3.
MR. CHUTE, MR. WITTER

212. Advanced Ruminant Nutrition—The nutrition of ruminants as contrasted to non-ruminants; with special emphasis on rumen physiology, nutrient

absorption and the role of rumen microorganisms in feed utilization. Prerequisite: AnV 155. *Rec* 2, *Lab* 2, *Cr* 4. MR. HOOVER

214. Energy Metabolism—Principles of direct and indirect calorimetry and the application of these principles to research methods. Prerequisite: AnV 155, 212. *Rec* 2, *Lab* 2, *Cr* 3. MR. COCK

218. Population Genetics—Application of genetic and biometric principles to the characteristics of populations. Prerequisite: AnV 161. *Rec* 3, *Cr* 3. MR. DICKEY

220. Gastrointestinal Physiology—A study of the anatomy and physiology of the gastrointestinal tract and the accessory organs of digestion in monogastric animals. Prerequisite: permission of instructor. *Cr* 3. MR. BIRD

310. Research Methods in Animal Science — A comprehensive study of statistical techniques applied to animal research. Includes principles of setting up experiments, analysis and interpretation of data and methods of reporting results. Prerequisite: Ms 167 or permission of instructor. MR. APGAR

†***316. Advanced Animal Nutrition*** — Studies in the metabolism and interrelationships of proteins, fats, carbohydrates, minerals and vitamins as they pertain to monogastric findings in this area. Prerequisite: AnV 155. *Cr* 3. MR. BLAMBERG

363. 364. Graduate Seminar in Animal Science—*Cr* 1. MR. HOOVER AND STAFF

390. Graduate Research in Animal Science—*Cr Ar.* STAFF

399. Graduate Thesis—*Cr Ar.* STAFF

POULTRY SCIENCE

Students desiring training in poultry science will major in animal sciences and will select courses with the sequence described on page 233. Students interested in this specialty will receive training in nutrition, physiology, and genetics and will have ample opportunity to select elective courses to prepare for a wide variety of career opportunities.

BACTERIOLOGY

PROFESSORS PRATT AND WHITEHILL; ASSOCIATE PROFESSORS BAIN, BUCK, GERSHMAN; ASSISTANT PROFESSOR NICHOLSON; LECTURER WAYMOUTH

The Bacteriology curriculum is designed to give students a thorough knowledge of biological principles while providing skills needed to study microorganisms and tissue culture.

Students with interests in bacteriology are prepared for a wide variety of positions in industry, government, and public health laboratories. With proper selection of electives a student can satisfy requirements to all medical and dental schools.

Students who are well qualified and interested are encouraged to pursue graduate work for further specialization. The Department of Bacteriology offers a master of science degree; a doctor of philosophy degree can be earned in a cooperating program.

Requirements for a B.S. degree are satisfactory completion of at least 120 degree hours at an accumulated grade-point average of not less than 1.80 in a course of study that conforms to the following curriculum:

Curriculum for Bacteriology Majors

Freshman Year. See Page 221

	Required Courses	Credit Hours	Minimum Degree Hours Required
A. BACTERIOLOGY			23
By 127	General Bacteriology	3	
By 128	General Bacteriology	2	
By 136	Determinative Bacteriology	4	
By 152	Pathogenic Bact. and Serology	4	
By 153	Bacterial Physiology	4	
By 176	Virology	4	
By 187, 188	Seminar	2	
B. GENERAL BIOLOGY			8
Bt 1 & Zo 3	General Botany and Animal Biol.	8	
or	or		
Zo 3 & Zo 4	Animal Biology (2 semesters)	8	
C. PHYSICAL SCIENCES			38
Ch 13, 14	General Chemistry	8	
Ch 151,152	Organic Chemistry	8	
Ch 161, 162	Organic Chemistry Lab.	4	
Ch 140	Quantitative Analysis	4	
Ps 1a, 1b	General Physics	8	
Bc 161	Physiological Chemistry	4	
Bc 164	Biochem. Lab. Methods	4	
D. MATHEMATICS			7
Ms 4	Algebra & Trigonometry	3	
Ms 12	Anal. Geom. and Calculus	4	
E. COMMUNICATIONS			9
Eh 1	Freshman Composition	3	
Eh 7, 8, 17	Composition	3	
Sh 1,	Speech	3	
F. HUMANITIES AND SOCIAL SCIENCES			15
Not less than two semester courses in each			
G. FRESHMAN ORIENTATION			0
H. PHYSICAL EDUCATION (2 semesters)			0
I. FREE ELECTIVES			20
Minimum degree hours for graduation			120

Courses in Bacteriology (By)

21. Introduction to Bacteriology—The basic principles of bacteriology and their application to agriculture, industry, sanitation, public health and disease. A descriptive and demonstration course for non-technical students. *Rec* 3, *Cr* 3.

21a. Elementary Microbiology Laboratory — A laboratory and demonstration course. Microscopy, cultivation, biochemical activities and control of microorganisms are considered. Prerequisite or corequisite: By 21 or By 127. STAFF

23. Paramedical Bacteriology—An elementary course in bacteriology, as

it applies to nursing. Emphasis on sanitation, infection, and resistance, and bacteriology of infectious diseases. *Rec* 3, *Lab* 2, *Cr* 4. MR. WHITEHILL

30. Fundamentals of Public Health—General consideration of the relationship between the health of the individual and environment. Prerequisite: By 21 or 127. *Lab* 4, *Cr* 4. MR. PRATT

46. Clinical Bacteriology—A course designed for individuals engaged in clinical bacteriology. Techniques for the isolation and identification of bacterial pathogens of significance to man and animals utilizing morphological, biochemical, serological and phage typing procedures. Where possible, clinical specimens will be used. CED offering only. Prerequisite: permission of instructor. *Rec* 2, *Lab* 2, *Cr* 3.

122. Microbiology and Man — The basic principles of bacteriology and their application to agriculture, industry, sanitation, public health and disease. Student participation in techniques dealing with laboratory procedures. Summer Session only. *Rec* 3, *Cr* 3.

127. General Bacteriology—A basic biology course dealing with general principles as illustrated by microorganisms, in particular, bacteria and viruses. Includes a consideration of cell structure, cell metabolism, genetics, geochemical activities, and host-parasite relations. *Rec* 3, *Cr* 3. STAFF

128. General Bacteriology Laboratory—A laboratory study of the properties of bacteria and related microorganisms. Emphasis is on technics and identification. Suggested for students majoring in sciences. Prerequisites or corequisite: By 127. *Lab* 4, *Cr* 2. STAFF

136. Determinative Bacteriology—A study of morphological, cultural and physiological characteristics of important bacterial groups with special emphasis placed on isolation and classification of organisms in our environment. Prerequisite: By 127, By 128. *Rec* 2, *Lab* 4, *Cr* 4. MR. BAIN

152. Pathogenic Bacteriology and Serology—The relationships and characteristics of microorganisms that cause disease in man and animals and the response of the latter to the invasion of the parasite. Prerequisite: By 127, By 128. *Rec* 2, *Lab* 4, *Cr* 4. MR. WHITEHILL

153. Bacterial Physiology — A study of the properties and behavior of bacteria with respect to their chemical and physical requirements for life and reproduction. Prerequisite: By 127, Ch 152. *Rec* 2, *Lab* 4, *Cr* 4. MR. BAIN

176. Virology—An introductory course in the study of viruses, emphasizing their nature, methods of cultivation, mode of transmission, and classification. Prerequisite: By 152 or permission of instructor. *Rec* 2, *Lab* 4, *Cr* 4. MR. BUCK

187. 188. Seminar—Preparation and presentation of papers dealing with current research and developments in the field of bacteriology. *Cr* 1. STAFF

191. 192. Problems in Bacteriology — A laboratory and conference for students desiring to pursue some particular line of bacteriological investigation. Prerequisite: permission of instructor. *Cr Ar.* STAFF

275. Tissue Culture Techniques and Mechanisms—A study of tissue culture techniques especially designed to acquaint the student with methods of growing tissue cells from various sources and the practical application. Prerequisite: By 128 or Bt 156. *Rec* 2, *Lab* 4, *Cr* 4. MR. BUCK

399. Graduate Thesis—*Cr Ar.* STAFF

There are many opportunities for the B.S. biochemist, and many more for those who continue for graduate degrees. The prescribed program in this catalog

is a good preparation for both stopping points. A foreign language, or even two, is recommended for those definitely planning graduate study.

Courses of study can be developed to fulfill admission requirements for medical and dental schools. At least 120 degree hours at an accumulative grade-point average of 1.80 are required for graduation.

Curriculum Leading to a Bachelor of Science Degree in Biochemistry

Freshman Year. See Page 221

Curriculum for Biochemistry Majors

Required Courses		Credit Hours	Minimum Degree Hours Required
A. BIOCHEMISTRY			17
Bc 161, 162	Advanced Biochemistry	7	
Bc 164	Biochemical Lab. Methods	4	
Bc 191, 192	Biochemical Research	6	
B. OTHER BIOLOGICAL AND PHYSICAL SCIENCES			41
Zo 3, 4	Animal Biology	8	
By 127, 128	General Bacteriology	5	
Ch 11, 12, or 13, 14	Chemistry	4	
Ch 140	Quant. Analysis	4	
Ch 151, 152	Organic Chemistry, Lec.	6	
Ch 161, 162	Organic Chemistry, Lab.	4	
Ps 1, 2	General Physics	10	
C. MATHEMATICS			11
Ms 4	Algebra & Trigonometry	3	
Ms 12	Anal. Geom. and Calculus	4	
Ms 27	Anal. Geom. and Calculus	4	
D. COMMUNICATIONS			8
Eh 1	Freshman Composition	3	
Sh 1	Funds. of Public Speaking	3	
Bc 171, 172	Seminar	2	
E. HUMANITIES			15
Not less than two semester hours in each—recommend one or more foreign languages.			
F. FRESHMAN ORIENTATION			0
G. PHYSICAL EDUCATION			0
H. ELECTIVES			28
Minimum Degree Hours Required for Graduation			**120**

Courses in Biochemistry (Bc)

*5. **Chemistry for Nurses (3-year)***—An introduction to the principles of inorganic, organic and biochemistry as needed for the three-year nursing curriculum. *Rec* 2, *Lab* 2, *Cr* 3. MRS. JACOBS

*7. **Fundamentals of Chemistry***—A review of the essential material from Inorganic Chemistry followed by a study of the types and reactions of organic compounds. Prerequisite: one year of high school chemistry. *Rec* 3, *Lab* 2, *Cr* 4. MR. LERNER

8. Elementary Physiological Chemistry—Carbohydrates, lipids, proteins, digestion, enzymes, metabolism, vitamins, hormones, blood and urine. Prerequisite Bc 7 or the equivalent. *Rec* 3, *Lab* 2, *Cr* 4. MR. LERNER

21. Organic Chemistry — Hydrocarbons, alcohols, acids, ketones, aldehydes, esters, amines, and amides. Prerequisite: Ch 1 and 2. *Rec* 3, *Lab* 2, *Cr* 4. MR. RADKE

122. Biochemistry—H-ion concentration; the properties, digestion, metabolism, and excretion of carbohydrates, fats and proteins; enzymes, vitamins, hormones. Prerequisite: Bc 1. *Rec* 3, *Lab* 2, *Cr* 4. MR. RADKE

159. Physical Biochemistry—A study of the fundamental laws, theories, and concepts of physical chemistry as they apply to biochemical problems. Prerequisite: Ch 140 and 152, Ps 2 or equivalent, Ms 12 or equivalent. *Rec* 3, *Lab* 3, *Cr* 4. MR. DEHAAS

161/162. Advanced Biochemistry—Carbohydrates, lipids, proteins, nucleic acids, vitamins, hormones, enzymes, coenzymes, metabolism, enzyme kinetics, bioenergetics and other topics. Prerequisite: Ch 152. *Rec* 3/3, *Lab* 3/0, *Cr* 4/3. STAFF

164. Biochemical Laboratory Methods—Chromatography, electrophoresis, tracer techniques, manometry, and other procedures employed in biological research. Prerequisite: Bc 161 or instructor's permission. *Lab* 8, *Cr* 4. MR. WRATTEN

171. 172. Seminar—Preparation and presentation of papers dealing with current research in the field of biochemistry. *Cr* 1. STAFF

191. 192. Biochemical Research—Problems in biological or agricultural chemistry. A comprehensive report is required. Seniors and graduate students only. *Cr Ar.* STAFF

†***220. Carbohydrates and Lipids***—The chemistry and metabolism of carbohydrates and lipids as they characterize different biological forms. Prerequisite: Bc 162 or permission. *Rec* 3, *Cr* 3. MR. DEHAAS, MR. LERNER

‡***225. Proteins and Enzymes***—A comprehensive study of the structure and properties of proteins with special emphasis on their catalytic activity. Prerequisite: Bc 162 or permission. *Rec* 3, *Cr* 3. MR. RADKE AND MR. WRATTEN

‡***230. Vitamins and Hormones***—The chemistry and biological activity of the regulators of living systems. Prerequisite: Bc 162 or permission. *Rec* 3, *Cr* 3. MR. DEHAAS

234. Plant Biochemistry — The biochemistry of photosynthesis, respiration and other metabolic processes in plants including growth regulators and essential elements. Prerequisite: Bc 162 or permission. *Rec* 3, *Cr* 3.

†***242. Biochemical Mechanisms***—Specific biochemical reaction mechanisms will be discussed in terms of the mechanistic principles of organic and inorganic chemistry. Prerequisite: Bc 159 or equivalent and Bc 161 or equivalent or permission. MR. LERNER

399. Graduate Thesis—*Cr Ar*

MR. DEHAAS, MR. LERNER, MR. RADKE, MR. WRATTEN

BIOLOGY

The Biology curriculum is designed to permit a student to gain a broad background in all of the natural sciences. He will at the same time receive some training in chemistry, physics and mathematics. In addition, the unusual extent

of elective opportunities in this curriculum permits students to exercise considerable freedom in choosing courses. This enables capable students to transfer at a later date into any one of the specialized fields of biology or applied fields of biology namely, animal science, plant science, and forestry and wildlife sciences.

Students preparing to teach high school biology will find this program appropriate. So will persons preparing for careers in medicine, marine biology, food science, for work with U.S. fisheries or as naturalist with private or public agency. This curriculum is equally appropriate for students wishing to have a broad basic training in the sciences related to biology and expecting to go on to graduate school for more specialized training leading to careers in college teaching, and research at the university level, in government or in biology based industries.

The Biology curriculum provides a basis for the student to gain some specialization with options available in: (1) Teaching High School Biology, (2) Premarine Biology, (3) Food Science (See page 248), and (4) Medicine.

The curriculum in Biology is an interdepartmental offering in the College of Life Sciences and Agriculture administered by a committee representing the Departments of Bacteriology, Biochemistry, Botany and Entomology.

Curriculum Leading to the B.S. Degree in Biology

Freshman Year. See Page 221

		Credit Hours	Minimum Degree Hours Required
A. BIOLOGICAL AND PHYSICAL SCIENCES			
1. Required			51
Ch 11-12 or 13-14	Chemistry	8	
Ms 4,12	Algebra & Trigonometry	7	
Ps 1a-2a	General Physics	8	
Bt 1-2	General Botany	8	
Zo 3-4	Animal Biology	8	
En 26	General Entomology	4	
By 127	General Bacteriology	3	
By 128	Gen. Bacteriology Lab.	2	
Zo 162	Genetics	3	
2. Electives			20
Bc 21,122	Organic and Biochemistry or		
Ch 151-152	Organic Chemistry Lec.	8 (10)	
Ch 161-162	Organic Chemistry Lab.		
By 136, Bt 154 En 140, Bt 159 Zo 139, 160, 232	Taxonomy	4 (3)	
Bc 161, Bt 153 By 153, Zo 177	Physiology	4	
Bt 135, En 251 Zo 133	Anatomy	4	
B. COMMUNICATIONS			9
Eh 1	Freshman Composition	3	
Eh 7, 8, or 17	Composition	3	
Sh 1 or Sh 31	Speech	3	

C. HUMANITIES AND SOCIAL SCIENCES minimum of 2 courses in each	15
D. FRESHMAN ORIENTATION	0
E. PHYSICAL EDUCATION (2 semesters)	0
F. FREE ELECTIVES*	25
Minimum Degree Hours Required for Graduation	**120**

* Recommended is a course in Ecology—Bt 130, En 143 or Fy 19.

BOTANY AND PLANT PATHOLOGY

ASSOCIATE PROFESSOR MCINTYRE (CHAIRMAN); PROFESSORS CAMPANA, COOPER, HILBORN, MANZER, RICHARDS; ASSOCIATE PROFESSOR MCCRUM; ASSISTANT PROFESSORS GELINAS, HOMOLA, NEUBAUER, VADAS; EMERITUS PROFESSOR HYLAND; COLLABORATOR YOUNG; LECTURER SHIGO.

The Botany curriculum leading to a bachelor of science degree is designed to afford the widest latitude for majors preparing for teaching and research in one or more of the biological sciences at all levels. Botany majors successfully completing the undergraduate requirements herein stated will be well qualified to enter graduate programs in botany and other biological disciplines at this and other institutions for advanced study.

Curriculum for Botany Majors

Freshman Year. See Page 221

Required Courses		Credit Hours	Minimum Degree Hours Required
A. BOTANY			27
Bt 1	General Botany	4	
Bt 2	Plant Kingdom	4	
Bt 135	Plant Anatomy	4	
Bt 153	Plant Physiology	4	
Bt 154	Taxonomy of Vascular Plants	4	
	Electives	7	
B. OTHER BIOLOGICAL SCIENCES			16
Zo 3, 4	Animal Biology	8	
By 127, 128	General Bacteriology	5	
Zo 162 or Bt 145	Principles of Genetics	8	
C. PHYSICAL SCIENCES			20
Ch 11-12 or 13-14	Chemistry	8	
Ch 151	Organic Chemistry Lec.	3	
Ch 161	Organic Chemistry Lab.	2	
or Bc 21	Organic Chemistry	(4)	
Ps 1a, 2a	General Physics	8	
D. MATHEMATICS			7
Ms 4	Algebra & Trignometry	3	
Ms 12	Analytic Geometry & Calculus	4	
E. COMMUNICATIONS			11
Eh 1	Freshman Composition	3	
Eh 7	Second-year Composition	3	
Eh 8	Second-year Composition	3	
Bt 161, 162	Seminar	2	

F. HUMANITIES AND SOCIAL SCIENCES Minimum of semester courses in each—and recommended not less than 8 hours in one of the following foreign languages: French, German, or Russian, which may meet the humanity requirement.		15
G. FRESHMAN ORIENTATION		0
H. PHYSICAL EDUCATION		0
I. ELECTIVES	28	24
Minimum Degree Hours Required for Graduation		**120**

Courses in Botany (Bt)

1. General Botany—An introduction to the structure, function, and reduction of seed plants. Open to students of all colleges. *Rec* 3, *Lab* 2, *Cr* 4.
MR. GELINAS

2. The Plant Kingdom — The morphology, reproduction, ecology and phylogenetic significance of the major classes of the plant kingdom. Open to students of all colleges. Prerequisite: Bt 1. *Rec* 3, *Lab* 2, *Cr* 4. MR. RICHARDS

33. Dendrology—Classroom and field work on identification and classification of trees and native shrubs of North America. Prerequisite: Bt 1. *Lec* 2, *Rec* 1, *Lab* 2, *Cr* 4. MR. RICHARDS

47. 48. Problems in Botany — Open to juniors and seniors who have special interest and qualification in botany. The approval of the head of the department is required. *Cr Ar.* STAFF

101. Role of Physics and Chemistry in Bioscience; Cellular Level—Basic consideration of the constituents of matter, centering around the molecule, as an aid to the understanding of structure and function of the living cell. Prerequisite: one or more courses, at the college level, in at least two of the relevant science disciplines (physics, chemistry, biology). Lec. and/or Lab. 3 hours per week. *Cr* 3. MR. HYLAND

102. Role of Physics and Chemistry in Bioscience; Organismal Level—Detailed consideration of the physical and chemical aspects of matter as related to tissues and the organism as a whole. Discussion of new techniques and technical advances which have aided in the understanding of the life processes of living organisms through physics and chemistry. Prerequisite: Bt. 101. Lec. and/or Lab. 3 hours per week. *Cr* 3.

110.* The Plant World—A course in botany designed for teachers instructing at the elementary and secondary school levels. The role of plants in the economy of man; basic study of plants including origin, classification, structure and development, function, modification, environment and distribution. Laboratory work in plant collection, identification and preservation. Techniques in methods of preparation of material for study, exhibits and displays. Additional requirements will be stipulated for graduate credit. *Rec* 3, *Cr* 3. MR. HYLAND

115.* Our Common Trees and Shrubs—A field course designed primarily to familiarize elementary and secondary school teachers with our native woody plants. Emphasis is placed on identification, classification and economic importance. Labelled collections will be made by students and kept as reference material. Additional requirements will be stipulated for graduate credit. *Rec* 3, *Cr* 3.
MR. HYLAND

120.* Structure of Plants Used by Man—A course designed to familiarize elementary and secondary school teachers with the structure of our common economic plants. Emphasis will be placed on the specific part of the plant used (i.e., stem, root, leaf, fruit, seed) and the nature of the tissues, cells or cell contents useful to man. Enrollment will be limited to 24. Prerequisite: Bt 1 or the basic general botany course required in any college or university of approved standing. Additional requirements will be stipulated for graduate credit. *Rec* 3, *Cr* 3. MR. HYLAND

124. Local Flora — Identification and classification of the common herbaceous flowering plants and ferns of Maine. Field trips will be taken to collect and study plants in various habitats. Additional requirements will be stipulated for graduate credit. *Rec* 3, *Cr* 3. MR. RICHARDS

125.* Non-Vascular Plants of Maine—Identification and classification of common algae, fungi, lichens and mosses of Maine. Field trips will be taken to collect and study plants in various habitats. Additional requirements will be stipulated for graduate credit. *Rec* 3, *Cr* 3. MR. RICHARDS

130. Plant Ecology—Principles of autecology, synecology, and vegetative analysis. Major emphasis on population biology and interactions at the population, community, and ecosystem level. Prerequisite: one year of biology or permission. *Rec* 2, *Lab* 2, *Cr* 3. MR. VADAS

131.* Plants and Environment—The dynamic aspects of the environmental relationships of plants. *Rec* 3, *Cr* 3. MR. COOPER

132.* Life Processes in Plants—A study of the fundamental life processes involved in the growth and reproduction of flowering plants. *Rec* 3, *Cr* 3. MR. COOPER

135. Plant Anatomy — The origin, development, and structure of tissue systems of vegetative and reproductive organs of vascular plants. Prerequisite: Bt 1. *Rec* 3, *Lab* 2, *Cr* 4. MR. NEUBAUER

145. Genetics—Principles of genetics. Prerequisite: one year of biology. Open to juniors and seniors. *Rec* 3, *Cr* 3.

149.** Structure and Identification of Wood—A study in wood structure and the relation of wood anatomy to structual endurance, decay resistance, and utility. Enrollment will be limited to 24. Additional assignments, involving a detailed microscopic study of some phase of wood anatomy, will be required for graduate credit. *Rec* 2, *Lab* 2, *Cr* 3. MR. HYLAND

150. Botanical Microtechnique—Methods of killing, embedding, sectioning, and staining plant material. Methods of studying and recording microscopic preparation. Prerequisite: Bt 135 and permission. *Rec* 2, *Lab* 4, *Cr* 4. MR. NEUBAUER

151. Plant Biology—A field course in botany designed to be of value in both elementary and secondary schools. The classwork will be given primarily in the field. All the major groups of plants will be covered with special attention to their type of habitat and plant relations. Student projects for use in their own classrooms will be encouraged. *Rec* 3, *Cr* 3. MR. COOPER

153. Plant Physiology—Classroom and laboratory work on the physiology of plants. Prerequisite: Bt 1 and one year of chemistry. *Rec* 2, *Lab* 4, *Cr* 4. MR. COOPER

153. Plant Physiology (Forestry)—Classroom and laboratory work on the physiology of plants. Prerequisite: Bt 1 and one year of chemistry. *Lec* 2, *Rec* 1, *Lab* 2, *Cr* 4. MR. COOPER

154. Taxonomy of Vascular Plants — Identification and classification of flowering plants. Prerequisite: Bt 1. *Rec* 2, *Lab* 4, *Cr* 4. MR. RICHARDS

156. Plant Pathology — Principles of plant disease. Open to juniors and seniors. Prerequisite: Bt 1. *Rec* 2, *Lab* 4, *Cr* 4. MR. CAMPANA, MR. MCINTYRE

156. Plant Pathology (Forestry) — Principles of plant disease. Open to juniors and seniors. Prerequisite: Bt 1. *Lec* 2, *Rec* 1, *Lab* 2, *Cr* 4. MR. CAMPANA

‡***159. General Mycology***—Comparative morphology, classification and identification of fungi, plus investigation of unusual hereditary and physiological characteristics. Prerequisite: Bt 1. *Rec* 2, *Lab* 4, *Cr* 4. MR. HOMOLA

161. 162. Seminar—Literature reviews. Techniques, procedures and results in botanical research. *Rec* 1, *Cr* 1. STAFF

163. Introductory Phycology — Morphology, identification, and classification of algae with minor emphasis on culturing, sexuality, physiology, and ecology. Prerequisite: Bt 1 and 2, one year of chemistry or permission. *Lec* 2, *Rec* 1, *Lab* 2, *Cr* 4. MR. VADAS

‡***256. Advanced Plant Pathology***—Advanced study of plant disease with emphasis on the physiology of parasitism and microbial interaction. Prerequisite: Bt 53 and Bt 56. *Rec* 2, *Lab* 4, *Cr* 4. MR. MCINTYRE, MR. CAMPANA

258. Advanced Plant Physiology—Advanced study of the physiology of plants, including photosynthesis, mineral nutrition, growth regulators, water relations, and respiration. Prerequisite: Bt 152. *Rec* 2, *Lab* 4, *Cr* 4. MR. COOPER

‡***260. Comparative Morphology of Vascular Plants***—Basic concepts on the origin and development of vascular plants, their morphology, anatomy, homologies and interrelationships. Prerequisite: Bt 135 or equivalent and permission. *Rec* 2, *Lab* 4, *Cr* 4. MR. NEUBAUER

‡***262. Plant Geography*** — The distribution of plants on the earth with emphasis on the causes of distributional phenomena. Field trips will be arranged. Prerequisite: Bt 154. *Rec* 3, *Cr* 3. MR. RICHARDS

301. Research Methods in Plant Science—Laboratory, greenhouse, and field techniques involved in botanical research. Prerequisite: Bt 153 or Bt 156 and permission of instructor. *Cr Ar.* STAFF

307. 308. Problems in Botany—*Cr Ar.* STAFF

399. Graduate Thesis—*Cr Ar.* STAFF

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* Permission of instructor required; offered through CED.

ENTOMOLOGY

PROFESSORS SIMPSON, BOULANGER, DIMOND, OLSON; ASSOCIATE PROFESSORS MCDANIEL, OSGOOD; ASSISTANT PROFESSOR STORCH

The Entomology curriculum is designed to provide training for various positions in government and industry or to lay a firm basis for further training at the graduate level, leading to teaching or extension positions in colleges or to research positions in experiment stations or in industry.

Students with sufficient background and interest will be encouraged to enter graduate school for further specialization. Such students are encouraged to elect foreign languages as undergraduates.

The Department of Entomology offers a master of science degree. A doctor of philosophy degree may be taken in the plant science field or through the Department of Zoology.

Curriculum Leading to a Bachelor of Science Degree in Entomology

Required Courses		Credit Hours	Minimum Degree Hours Required
A. ENTOMOLOGY			15
En 26	Introductory Entomology	4	
En 140	Elementary Taxonomy of Insects	4	
En 153	Advanced Taxonomy of Insects	4	
En 149	Economic Entomology	3	
B. OTHER BIOLOGICAL SCIENCES			40
Bt 1	General Botany	4	
Bt 154	Taxonomy of Vascular Plants	4	
By 127-128	Bacteriology	5	
Bc 21 and 122	Biochemistry	8	
Zo 3, 4	Animal Biology	8	
Zo 153	Invertebrate Zoology	4	
Zo 158	Parasitology	4	
Zo 162	Genetics	3	
C. PHYSICAL SCIENCES			16
Ch 11-12 or 13-14	Chemistry	8	
Ps 1a-2a	General Physics	8	
D. MATHEMATICS			7
Ms 4	Algebra & Trigonometry	3	
Ms 12	Analytic Geometry and Calculus	4	
E. COMMUNICATIONS			7
Eh 1	Freshman Composition	3	
Sh 1	Public Speaking) or	3	
En 161-162	Seminar)	2	
	Elective	2 (3	
F. HUMANITIES AND SOCIAL SCIENCES			15
Not less than two semester courses in each area. A foreign language, French, German or Russian—at least 8 hours of any one—may be used to meet the humanities requirement			
G. FRESHMAN ORIENTATION			0
H. PHYSICAL EDUCATION			0
I. ELECTIVES: Suggested Zo 156 Animal Ecology Ms 19 Statistics			20
Minimum Degree Hours Required for Graduation			120

Courses in Entomology (En)

26. Introductory Entomology—Fundamental principles of insect life and the relation of insects to plants, animals, and man. A study of structure, metamorphosis, ecology, and classification. An insect collection is required in the spring semester. Students may wish to start their collections before taking the course. Prerequisite: Bt 1 or Zo 3. *Rec* 2, *Lab* 4, *Cr* 4. MR. STORCH

26a. Introductory Entomology for Foresters—Principles of insect life with emphasis in lectures on technical aspects of interest to professional foresters. Laboratories are identical with and combined with En 26. Offered in the spring semester only. Prerequisite: Bt 1 or Zo 3. *Rec* 2, *Lab* 4, *Cr* 4. MR. OSGOOD

47. 48. Problems in Entomology—Open to juniors and seniors in any college who have special interest and qualifications in entomology. The approval of the head of the department is required. *Cr Ar.* STAFF

140. Elementary Taxonomy of Insects—Study of insects with emphasis on classification of lower orders and the Coleoptera. Methods of collecting and identification. Prerequisite: En 26. *Rec* 2, *Lab* 4, *Cr* 4. MR. OSGOOD

143. Forest Insect Ecology—Study of factors which regulate the distribution and abundance of insects, particularly in the forest environment. Characteristics of outbreaks and methods of suppression are discussed. Prerequisite: En 26. *Rec* 2, *Lab* 2, *Cr* 3. MR. OSGOOD

†***149. Economic Entomology***—Introduction to the basic principles involved in applied control of insects other than those found in the forest environment. Emphasis on factors comprising biological, cultural, and chemical control methods and their ecological implications. Survey of legislation bearing on applied entomology. Prerequisite: En 26. *Rec* 2, *Lab* 2, *Cr* 3. MR. BOULANGER

†***153. Advanced Taxonomy of Insects***—Study of wing venation; classification of Diptera, Lepidoptera and Hymenoptera. Prerequisite: En 26. *Rec* 2, *Lab* 4, *Cr* 4. MR. OSGOOD

161. 162. Seminar—A study of the literature and techniques of entomology. *Rec* 1, *Cr* 1. STAFF

205. 206. Problems in Entomology—*Cr Ar.* STAFF

‡***210. Taxonomy of Immature Insects***—General morphology of immature insects. Identification of larvae in the orders Coleoptera, Lepidoptera, Diptera, and Hymenoptera. Prerequisite: En 151 and 153 or permission. *Rec* 1, *Lab* 4, *Cr* 3. MR. BOULANGER

211. Insect Ecology—A study of factors governing distribution and abundance of insect populations in nature. Life-table approach to ecological studies using insects as examples. Outside readings. Prerequisite: En 151 and 153 or permission. *Rec* 1, *Lab* 2, *Cr* 2. MR. DIMOND

†***214. Medical Entomology*** — Training in recognition, classification, life cycles, habits and control of insects and near relatives that cause disease or function as vectors of pathogens. Prerequisite: En 26 and Zo 158 or permission of instructor. *Rec* 2, *Lab* 2, *Cr* 3. MR. MCDANIEL.

‡***251. Morphology of Insects*** — External and internal anatomy of insects. Laboratory includes gross dissections of internal organs of representative insects. Prerequisite: En 26. *Rec* 2, *Lab* 4, *Cr* 4. MR. STORCH

312. Biological Control of Insects—Reading of significant original contributions. May be repeated with permission by covering different areas, e.g., viruses, fungi, parasites and predators, radiation sterility, etc. Prerequisite: En 149. *Rec* 1, *Cr* 1. MR. SIMPSON

†***314. Behavior of Arthropods***—Anatomy of the nervous system, especially sensory receptors. Basic patterns of orientation to extrinsic stimuli. Significance of behavioral patterns to the survival of individuals and populations. Prerequisite: permission. *Rec* 2, *Lab* 2, *Cr* 3. MR. DIMOND, MR. STORCH

315. Insect Toxicology—Lectures and reading assignments. Fundamentals of insect toxicology, recent advances in the field, nature, and mechanism of insect resistance to insecticides. Laboratory problems to be arranged. Prerequisite: En 151 and Bc 1 or Bc 2. *Rec* 2, *Lab* 2, *Cr* 3. STAFF

399. Graduate Thesis—*Cr Ar.* MR. SIMPSON

FOOD SCIENCE

PROFESSORS HOGAN, HIGHLANDS, MURPHY; ASSISTANT PROFESSOR ILLYN

The Department of Food Science offers no undergraduate program leading to a bachelor of science degree. Rather, course offerings serve primarily as supporting courses for the various programs in the biological sciences and agricultural and resource economics. Students wishing some specialization in food science may enroll in the Biology program (page 240) and elect the courses specified in the Food Science Option.

Food Science Option

		Required	Credit Hours
ARE	159	Agricultural Business Management	3
Fn	152	Human Nutrition	3
Fs	101	Food Processing Industry—Principles and Problems	3
Fs	202	Food Industry Quality Control	3
		Recommended	
AnV	45	Animal Science	3
ARE	164	Statistical Quality Control	3
By	136	Determinative Bacteriology	4
Ms	19	Principles of Statistical Inference	3
P	21	Crop Science	3
S	2	Soil Science	4

As a part of the New England Board of Higher Education plan for regional cooperation, the first two years of a program in Food Science and Technology may be taken at the University of Maine and the final two years of specialized training completed at the University of Massachusetts at resident tuition rates. See page 272 for the two-year program at the University of Maine.

Courses in Food Science (Fs)

101. Food Processing Industry Principles and Problems—Scope of the food manufacturing industry, processing principles and practices discussed in relation to product quality and problems involved. *Rec* 3, *Cr* 3.

MR. HIGHLANDS, MR. HOGAN

202. Food Industry Quality Control — Formulation of product criteria, quality evaluation (sensory and objective procedures) and quality control procedures. Prerequisite: Fs 101 or permission of the instructor. *Rec* 2, *Lab* 2, *Cr* 3.

MR. HIGHLANDS, MISS MURPHY

281. 282. Problems in Food Science—Enrollment by permission. *Cr Ar.*

MR. HIGHLANDS, MR. HOGAN

399. Graduate Thesis—*Cr Ar.* STAFF

The School of Forest Resources

DIRECTOR NUTTING; ASSOCIATE DIRECTORS (FORESTRY AND FOREST PRODUCTS) CORCORAN, (WILDLIFE) COULTER; PROFESSORS BAKER, CORCORAN, COULTER, DIMOND, GRIFFIN, MENDALL, YOUNG; ASSOCIATE PROFESSORS GIDDINGS, PLUMMER, RANDALL, SCHEMNITZ, SCHOMAKER, SHOTTAFER; ASSISTANT PROFESSORS ASHLEY, GILBERT, HALE, KUTSCHA, OWEN, RICHENS, SHULER, WHITTAKER; INSTRUCTORS ROBBINS, WILSON

Two curricula with seven sequences are offered in the School of Forest Resources. They have a common freshman year. The objectives are: (1) to train students in the theories and techniques for positions in forest land management, forest product harvesting, manufacture and sale, and game management; (2) to prepare qualifying students for graduate work; (3) to provide a broad education for effective citizenship.

Graduation requirements in the School of Forest Resources are: (1) passing grades in all required courses; (2) successful completion of 132 degree hours plus summer camp (8 hours) and spring trips (1 hour) or alternatives as required in the sequence selected; (3) an accumulative average of not less than 1.80.

FORESTRY AND FOREST PRODUCTS

The sequences for Forestry and Forest Products offers students an opportunity to qualify for a degree in forestry, membership in the Society of American Foresters or other professional societies, and for civil service positions in public agencies and for positions with private industry employing professional foresters. Graduates of the School have been employed in about equal numbers by private industry and public agencies. Students with qualifying grades are encouraged to pursue graduate work. All sequences provide an opportunity for a broad education by requiring both cultural and scientific courses supplemented by several hours of electives.

The University Forest is managed by the School. This tract of 1,750 acres lies within two miles of the campus and is used extensively for field laboratory work and for research. The School assists the Maine Forest Service in the management of Indian Township in eastern Maine. This tract of 17,000 acres is close to the location of Camp Robert I. Ashman where the summer camp courses required of forestry and wildlife majors are given. A large variety of wood-producing wood-using firms are located near the school and the summer camp area.

Field or work experience is essential to foresters. Students are urged to obtain summer woods or other appropriate employment.

Two off-campus training periods are required of forestry students. (1) A week's field trip through New England in silviculture or utilization is required of all forestry students at the completion of the junior year. (2) Immediately following the junior field trips, six weeks at camp near Princeton, Maine (Indian Township), is required.

The program in Wood Science and Technology emphasizes the study of the properties and basic structural components of wood, as well as the conversion and

distribution of wood-based products. The off-campus training phase of this program provides for approved employment experience followed by a comprehensive report as a possible alternative to spring trip and summer camp requirements.

Students are accepted for graduate work in the fields of forest economics, management, recreation, silviculture, utilization, and wood science and technology leading to the degree of master of science in forestry. A program leading to doctor of philosophy degree in specialized fields is anticipated within the near future.

WILDLIFE MANAGEMENT

The two sequences in Wildlife Management offer a broad training in the natural sciences. The management sequence is designed to train students for forestland, game habitat management, and, with high grades, for graduate work. The science sequence is designed for students with high grades who are most interested in biology and who plan to do graduate work. Upon completion of the curriculum requirements the student is granted the degree of bachelor of science in wildlife management.

Off-campus training of seven weeks is required of all students in the Wildlife Management sequence at the Forestry Summer Camp near Princeton.

Field experience is important to wildlife managers. Students are urged to obtain summer field employment.

Seniors and graduates are eligible for Civil Service examinations for positions with federal and state agencies that administer natural resources.

A graduate program in wildlife is offered by the University and a number of graduate courses are available to qualified students.

The Maine Cooperative Wildlife Research Unit provides for a cooperative wildlife program jointly sponsored and financed by the University, the Maine Department of Inland Fisheries and Game, the U.S. Fish and Wildlife Service, and the Wildlife Management Institute. The director of the school is the University representative on the Coordinating Committee. The purpose of the unit is to conduct and promote research, student training and public education in the wildlife field.

Curricula and Sequences

Students in forestry and wildlife have seven sequences from which to choose their program.

- Forest Management
- Forest Utilization
- Forest Science (Tree Growing)
- Wood Science and Technology
- General Forestry
- Wildlife Science
- Wildlife Management

Freshman Year

A common freshman year program is recommended for all students in the School of Forest Resources (see page 221). Selection of an upperclass specialization sequence is made near the end of the second semester.

Basic Core: All students are required to take the following 63 credit hours of core courses:

			Hours Required	Frosh.	Soph.	Jr.	Senior
Ch	11-12						
or	13-14	Chemistry	8	8			
Bt	1	Botany	4	4			
Bt	33	Dendrology or					
Bt	154	Taxonomy	4		4		
Ps	6	Physics	5		5		
Ms	4	Algebra & Trigonometry	3	3			
Zo	3	Zoology	4	4			
Eh	1	Freshman Composition	3	3			
Eh	5	Technical Composition	2			2	
Sh	1	Speech	3		3		
		Literature or Fine Arts	2		2		
		History or Government	2		2		
Ec	1 & 2	Economics	6		6		
Ge	1	Intro. to Engrg. Design	2	2			
Ce	5	Surveying	3		3		
Fy	1 & 2	Introduction to Forest Resources	4	4			
Fy	4 & 5	Mensuration	6		6		
Fy	60	Seminar	1				1
		Total	62	28	31	2	1

Additional Required Courses

All Forestry Sequences

			Credit Hours
En	26	Entomology	4
Fy	7	Silvics	3
Fy	8	Silviculture*	3
Fy	112	Wood Technology I	2
Fy	149	Timber Management and Valuation*	4
Fy	144	Forest Economics	3
		Spring Trip*	1
		Summer Camp*	8
			28

All Wildlife Sequences

			Credit Hours
S	3	Forest Soils	3
Bt	154	Vascular Plants	4
Fy	7	Silvics	3
Fy	19	Wildlife Ecology	2
Fy	127	Wildlife Biology	4
Zo	153	Invertebrate Zoology	4
			20

* Except wood science (summer camp required for all participants in the five-year Pulp and Paper Program).

Forestry Management Sequence

			Credit Hours
S	3	Forest Soils	3
Bt	153	Plant Physiology	4
Bt	156	Forest Pathology	4
Ge	12	Forest Drawing	2
Ba	9	Accounting	3
Fy	6	Forest Photogrammetry	3
Fy	10	Forest Planting	2

Forest Utilization Sequence

			Credit Hours
Bt	135	Plant Anatomy	4
Ge	12	Forestry Drawing	2
Ba	9	Accounting	3
Fy	11	Forest Fire Control	2
Fy	13	Harvesting Forest Crops	2
Fy	14	Forest Products	3
Fy	16	Wood Identification	1

Fy	11	Forest Fire Control	2
Fy	13	Harvesting Forest Crops	2
Fy	146	Forest Policy and Administration	3
Gy	6	Geology for Engineers	3
Fy	8s	Silviculture Trip	1
Fy	146	Forest Policy and Administration	3
Fy	112	Wood Tech. I (with Lab.)	3
Fy	125	Wood Tech. II	3
Fy	135	Utilization Trip	1

Forest Science—Forest Growth Sequence

			Credit Hours
S	3	Forest Soils	3
Bt	153	Plant Physiology	4
Fy	10	Forest Planting	2
Fy	13	Harvesting Forest Crops	2
Fy	14	Forest Products	4
Fy	146	Forest Policy and Administration	3
Gy	6	Geology for Engineers	3
Ms	12	Anal. Geom. & Calculus	4
Ps 1 & 2		Physics	10

Wood Science and Technology Sequence

			Credit Hours
Bt	135	Plant Anatomy	4
Bt	156	Forest Pathology	4
Fy	14	Forest Products	4
Fy	116	Wood Identification	1
M	12 & 27	Anal. Geom. & Calculus	4
Ps 1 & 2		Physics	10
Fy	125	Wood Tech. II	3

General Forestry Sequence

	Credit Hours
Botany, Geology, Soils	6
Forestry	15

Wildlife Management Sequence

			Credit Hours
AnP	144	Disease & Parasite Cont.	3
En	26	General Entomology	4
Fy	6	Photogrammetry	3
Fy	134	Timber Management	3
Fy	41s	Summer Camp	9
Fy	19s	Wildlife Ecology	4
Fy	144	Forest Economics	2
Zo	132	Ichthyology	4
Zo	139	Mammalogy	3
Zo	160	Ornithology	4
Zo	171	Fish Management	4

Wildlife Science Sequence

			Credit Hours
En	26	General Entomology	4
Zo	160	Ornithology	4
Zo	139	Mammalogy	3
Zo	153	Invertebrate Zoology	4
Fy	7 or 8	Silvics or Silviculture	3
Ps	1a	General Physics	4
Ps	2a	General Physics	4

Courses in the School of Forest Resources (Fy)

1. Introduction to Forest Resources I—Instruments and techniques for field measurements—orientation. Required of freshmen in the School of Forest Resources. *Rec* 1, *Lab* 3, *Cr* 2. STAFF

2. Introduction to Forest Resources II—A survey of the fields of forestry, wood technology, and wildlife. Required of freshmen in the School of Forest Resources. *Rec* 2, *Cr* 2. STAFF

4. Forest Sampling Methods — Elementary statistical background and sampling procedures based on statistics in forestry and wildlife. Use of desk calculators and introduction to electronic computers. Prerequisite: Ms 1 and 3. *Rec* 2, *Lab* 3, *Cr* 3. MR. ASHLEY

5. Forest Mensuration—Determination of volume of standing and felled

timber. Construction of log rules, volume tables, and yield tables. Determination of growth and yield. Prerequisite: surveying. *Rec* 2, *Lab* 3, *Cr* 3. MR. ASHLEY

6. Forest Photogrammetry—Construction of planimetric and topographic maps by photogrammetric methods. Determination of forest types and stand composition by interpretation and measurements of air photos. *Rec* 2, *Lab* 3, *Cr* 3. MR. ASHLEY

7. Silvics—Biological principles and environmental factors governing the natural establishment and development of forest trees and stands. Prerequisite: Bt 33. *Rec* 2, *Lab* 3, *Cr* 3. MR. GRIFFIN

8. Silviculture—Technical methods of controlling the composition, growth, quality, and regeneration of forest stands. Prerequisite: Fy 7. *Rec* 2, *Lab* 3, *Cr* 3. MR. GRIFFIN

8s. Silviculture Trip — One week is spent visiting public and private forests of the Northeast. Silvicultural problems and methods of managing important forest types of the region are studied. *Cr* 1. MR. GRIFFIN

10. Forest Planting—The planting, care, and selection of stock in nursery and field plantings. Seed collecting and processing. Mechanical planting and field techniques. One-day field trip required. *Rec* 1, *Lab* 3, *Cr* 2. MR. PLUMMER

11. Forest Fire Control — Forest fire behavior as influenced by fuels, weather, topography. Effects of fire. Methods of preventing and controlling fires. Use of fire in forest management. *Rec* 2, *Cr* 2. STAFF

13. Harvesting of Forest Crops — Harvesting methods in the various regions of the United States and Canada, with special emphasis on the Northeast. Discussion of organization, costs, equipment, and trends. *Rec* 2, *Cr* 2. MR. PLUMMER

13s. Utilization Trip—One-week field trip to northern New England and adjacent Canadian provinces to visit woods operations and forest management projects. *Cr* 1. MR. PLUMMER AND STAFF

14. Primary Wood Processes—Introduction to the conversion processes involved with the principal primary forest products, such as lumber, pulp, veneer, and derived products. Characteristic properties of typical products; effect of raw material on processing technology. *Rec* 3, *Lab* 3, *Cr* 4. MR. HALE

17. Wood Preservation—Causes of deterioration of wood in service; preservatives, preparation of material; wood preserving process. *Rec* 2, *one-half semester, Cr* 1. MR. BAKER

19. Wildlife Ecology—Geographic and ecologic distribution of game birds and mammals. Ecologic principles of game management. No freshmen. *Rec* 2, *Cr* 2. MR. COULTER, MR. OWEN

19s. Wildlife Ecology—Field problems in forest-wildlife ecology. Recognition, measurement analysis and interpretation of problems in forest-wildlife relationships. Three weeks at camp. *Cr* 4. MR. SCHEMNITZ

24. Range Management—History and economic importance of the range livestock industry. Utilization and management of the forage resource; relation to other land use. National and regional problems in grazing use; administration of public grazing lands. *Rec* 2, *Cr* 2. STAFF

30. Wildlife Law Enforcement—The role of law enforcement in modern wildlife management. History and development of law and relationship to present policies. Description of organizations. Operations and duties of personnel. *Rec* 2, *Cr* 2. MR. SCHEMNITZ

45. 46. Special Problems—Original investigation in advanced forestry and wildlife work, the subject to be chosen after consultation with the staff. Open to high-ranking juniors and seniors. *Cr Ar.* STAFF

48. Natural Resources—The characteristics, status, utilization, and management of natural resources. The social aspects of resources management. Open to juniors and seniors. *Rec* 2, *Cr* 2. STAFF

53. Forest Recreation Management — Methods of evaluation, planning and development of wildlands for recreation. Importance, problems, and trends. Public and private programs and policies. Offered to Forest Resources majors or by permission of instructor. Two Saturday field trips required. *Rec* 2, *Cr* 2. MR. WHITTAKER

60. Seminar — Reviews of literature. Current problems in forestry and conservation. Majors, Forest Resources. *Rec* 1, *Cr* 1. MR. NUTTING, MR. COULTER

112. Wood Technology I—The structural and physio-chemical nature of wood and its response to environmental, physical, and chemical influences. Study of growth-material relationships and basic laboratory techniques. Prerequisites: Without lab: *Rec* 2, *Cr* 2; with lab, *Rec* 2, *Lab* 2, *Cr* 3. (Lab required of forest utilization majors). MR. KUTSCHA

116. Wood Anatomy—Identification and anatomical characteristics of wood and wood fibers by gross and microscopic features. Prerequisite: Bt 135 or permission of instructor. *Lec* 2, *Lab* 4, *Cr* 4. MR. KUTSCHA

125. Wood Technology II—Advanced wood physics and mechanics. The mechanical properties of wood and wood composites and their use in structural applications. The relationship of mechanical and physical properties to basic processing techniques. Prerequisite: Fy 112 with lab. *Rec* 2, *Lab* 2, *Cr* 3. MR. SHOTTAFER

126. Analysis in Forest Utilization—Study of processing, research and development problems and review of current methods of anaylsis and solution. Application of process design, systems analysis and materials technology in the investigative situation. Prerequisite: permission of instructor. *Rec* 2, *Lab* 2, *Cr* 3. MR. SHOTTAFER AND STAFF

127. Wildlife Biology — The principles of wildlife biology. Study of the biological, economic and human relations factors influencing wildlife resources. Prerequisites: Fy 19, Bt 154, Fy 7, Zo 139 or 160, or equivalents. *Rec* 2, *Lab* 4, *Cr* 4. MR. SCHEMNITZ

128. Game Management—The practice of game management. Study of the biological, economic and human relations factors influencing management programs. For non-wildlife majors. *Rec* 2, *Cr* 2. MR. RICHENS

129. Research Methods in Wood Technology—Advanced methods of evaluating wood, wood based, and related materials. Introduction to standard evaluation techniques and concepts of evaluation design. Review of pertinent laboratory equipment and its applications. Prerequisite: Fy 4, Fy 112, Fy 125. *Rec* 1, *Lab* 4, *Cr* 3. MR. SHOTTAFER AND STAFF

144. Forestry Economics—Forest resources of U.S. and the world and prospects of meeting increased demand for forest products. Economic factors in forest production and use of economic analysis in making forest management decisions. Prerequisite: Ec 1, Ec 2. *Rec* 3, *Cr* 3. MR. CORCORAN

146. Forest Policy and Administration—Federal, state and private forest policies in U.S., comparisons to foreign countries. Land ownership and usage.

Administration of national, state and private forests. Organizing, staffing, and equipping forestry enterprises. Majors, Forest Resources. *Rec* 3, *Cr* 3.
MR. WHITTAKER

149. Timber Management and Valuation—Managing forest properties for sustained yield of timber products. Determination of annual cut and effect of taxation. Evaluating forest investments. Preparation of management plans. Majors, Forest Resources. *Rec* 3, *Lab* 2, *Cr* 4. MR. GIDDINGS

157. Forest-Water Relationships—Role of forests in water cycle. Effect of logging, recreation, mining, and other forest land uses on water resources. Prerequisite: Fy 4, Fy 7, or their equivalents, or permission of instructor. *Rec* 2, *Lab* 2, *Cr* 3. MR. SCHOMAKER

171. Production Analysis in Forestry—Introduction to concepts and procedures used in the evaluation of timber production and forest production manufacturing with emphasis on study organization, work measurement, job evaluation, cost control, network analysis and schematic models. Seniors, graduate students, or consent of instructor. *Rec* 2, *Cr* 2. MR. CORCORAN

172. Planning and Control of Forestry Operations—Applications of scientific methods to management decision problems of forestry operations. Emphasis on inventory control, allocation methods, replacement models, waiting-line analysis sequencing, simulation, and competitive strategies. Seniors, graduate students, or consent of instructor. *Rec* 2, *Cr* 2. MR. CORCORAN

200. Forest Hydrology and Watershed Management—The study of hydrologic cycle as it applies to forest lands and forest land management. Methods of water-yield control through silvicultural practices. The effect of logging and other land-use practices on water quality, erosion, and the silting of water courses. Prerequisites: Fy 7, Fy 232, or consent of instructor. *Rec* 2, *Cr* 2. MR. SCHOMAKER

209. Regional Silviculture—Applied silvicultural practices and results of current silvicultural research in important forest types of the United States. Prerequisite: Fy 8. *Rec* 2, *Cr* 2. MR. GRIFFIN

228. Advanced Wildlife Ecology—A study of the factors affecting the distribution, abundance, and physiology of wildlife species. Prerequisite: Fy 127, or permission of instructor. *Rec* 3, *Lab* 2, and occasional Saturday field trips. *Cr* 4.
MR. OWEN

232. Forest Influences—Effects of forest vegetation upon climatic factors, soil water, stream flow, floods, erosion, and soil productivity. Prerequisite: Fy 7 and Ag 3. *Rec* 2, *Cr* 2. MR. GRIFFIN

247. Advanced Forest Mensuration—Advanced sampling methods and the principles of regression analysis as applied to forestry and wildlife in management and research. Applications with computers. Prerequisite: Fy 4, Ms 19 or Ag 70 and consent of instructor. *Rec* 3, *Cr* 3. MR. YOUNG

254. Forest Recreation Planning—Methods of measuring, analyzing, and forecasting recreational use of forest lands. Concepts of planning, and their application to forest recreation management. Prerequisite: Fy 53, Are 171, or permission of instructor. *Rec* 3, *Cr* 3. MR. WHITTAKER AND MR. CORCORAN

276. Forest Inventory and Growth--Principles and exploration in detail of approaches to inventory and growth. Field trips will be required. Forestry juniors, seniors, graduate students, and consent of instructor. Prerequisite: Fy 4 and 5. *Rec* 2, *Cr* 2. MR. YOUNG

***301. 302. Forest Mensuration Problems**—Cr Ar.*
MR. YOUNG AND MR. ASHLEY

***303. 304. Forest Management Problems**—Cr Ar.* STAFF

***305. 306. Game Management Problems**—Cr Ar.* STAFF

***307. 308. Silviculture Problems**—Cr Ar.* MR. GRIFFIN

***309. 310. Photogrammetry Problems**—Cr Ar.*
MR. YOUNG AND MR. ASHLEY

***311. 312. Research Problems in Forestry Economics**—Cr Ar.*
MR. CORCORAN

***313. 314. Forest Recreation Problems**—Cr Ar.* STAFF

***315. 316. Problems in Wood Technology**—Cr Ar.* STAFF

***350. Graduate Seminar in Wildlife Science**—Cr Ar.* MR. COULTER

***399. Graduate Thesis**—Cr Ar.* STAFF

Forestry Summer Camp

41s. Practice of Forestry — Field practice in methods and problems involved in the management of a large forest property. Timber estimating and marketing, surveying, fire control, logging, preparation of a management plan. Visits to woods operations and utilization plants. Prerequisite: Fy 5, 8. Forty-eight hours a week. Forestry, six weeks. *Cr* 8; Wildlife, four weeks. *Cr* 5.
MR. RANDALL AND STAFF

School of Home Economics

DIRECTOR THORNBURY; PROFESSOR RICE; ASSOCIATE PROFESSOR AXFORD; ASSISTANT PROFESSORS BRIGHTMAN, DAHL, FRASER, OLIVER, PARADISE, SCHOMAKER; INSTRUCTORS DALTON, HUTCHINSON, LAFFERTY, MUSGRAVE, SAWYER, YOUNG

Home economics encompasses physical, social, economic, and aesthetic aspects of living in complex, technologically advancing societies. Emphasis is given to the unique combination of needs of family units at a given time for food, housing, clothing, management of resources, human development, and interpersonal relationships with training designed to prepare the student for employment or family life. This involves coordinating knowledge from fields of learning that contribute to understanding needs and helping people to use this information to solve human problems.

The undergraduate curriculum leads to a bachelor of science degree in home economics. About half of the student's program includes courses in the arts, humanities, social and biological sciences, and specialized subjects offered within the school in child development, family relationships, clothing, design, food, nutrition, home economics education, home management and housing. The other half of the student's program is designed to meet demands of preprofessional or professional employment as follows:

Food and Nutrition Programs—Dietetic intern in programs approved by the American Dietetic Association: food service administrator in commercial, industrial, publicly owned, or private food establishments; research assistant in food and nutrition; product development supervisor.

Education Programs—Teacher in childhood education in nursery and elementary schools; consultant in child development for a social service agency; teacher of home economics in public schools; teacher of youth and adults through extension activities; teacher of health and family life; educational director for consumer services; family relationships specialist.

Individual sequences of courses may be developed for students from other countries and persons not attempting to qualify for any of the recognized home economics professions covered in other sequences. These sequences will consist of selected advanced home economics courses and related subjects in other divisions of the University.

A minimum of 120 semester hours is required for graduation at an accumulative grade point average of 1.80.

CURRICULUM FOR B.S. IN HOME ECONOMICS

All students are required to take the following 34 hours:

Communications — 6 hours

Eh 1 —Freshman English
Sh 1 —Fundamentals of Public Speaking or
Sh 31 —Voice and Diction or
Sh 41 —Fundamentals of Oral Interpretation

Physical Sciences — 8 hours

To be selected from botany, geology, chemistry, entomology, physics, bacteriology or zoology. One year of this work must be basic courses in laboratory science

Social Sciences — 12 hours

Py 1 and 2 are required and others to be selected from sociology, psychology, history, government, economics or modern society.

Humanities — 8 hours

Philosophy, art, literature and music.
(Must represent two fields)

Requirements in pre-professional and professional sequences, and electives to make a total of the required 120 hours.

Additional Required Courses in Professional Sequences:

I. FOOD AND NUTRITION SEQUENCES:

(Science requirements depend on option)

Option A—Dietetic Intern*

Ba	9	Principles of Accounting	3
By	127	Intro. to Bacteriology	3
Fn	41	Intro. to Food & Nutrition	3
Fn	42	Family Food Management	3
Fn	43	Experimental Foods	4
Fn	152	Human Nutrition	3
Fn	155	Abnormal Nutrition	3
Fn	61/62	Quantity Food & Food Service Management	6
Fn	63	Food Service Administration & Cost Control	3
Hm	93	Equipment	3
Py	111	Business & Industrial Psychology	3
Py	117	Educational Psychology	3
Zo	8	Anatomy & Physiology	4
		Total	44

* Approved by American Dietetic Association and recommended for all dietitians.

Option B — Food Service Administrators

Same as Option A, except that additional courses in business, economics, food and nutrition may be substituted for Fn 155, Py 111, and Py 117.

Option C — Nutritionists, research assistants in food and nutrition and supervisors in product development

Same as Option A, except courses in chemistry, math and physics may be substituted for Fn 61, Fn 62, Fn 63, Hm 93, Ba 9, Py 111, and Py 117.

II. EDUCATION SEQUENCES:

A limited number of students may arrange to spend one semester at the Merrill-Palmer Institute in Detroit, Michigan.

CHILD DEVELOPMENT

Basic Core

Cf	2	Patterns of Interpersonal Behavior (nursery school lab experiences)	3
Cf	3	The Preschool Child	3
Cf	4	The Young School Child	3
Cf	111	Family Relationships	3
Fn	41	Intro. to Food & Nutrition	3
Hm	185	The Family's Financial Problems	3
		Total	18

Option A—Elementary School Teachers (for certification to teach kindergarten through grade 6)

Cf	120	Creative Activities for the Young Child	3
	or		
At	69	The Teaching of Art	2
Cf	153	The Younger Child in Home & in School	3
Cf	260	Seminar in Child Development	3
Ed	B2	The American School	3
Ed	B4	The Teaching Process	3
Ed	M13	Teaching of Reading	3
Ed	M18	Teaching of Language Arts	3
Ed	M114	Teaching Arithmetic	3
Ed	M115	Teaching Social Studies	3
Ed	M116	Teaching Science	3
Ed	M190	Student Teaching	6
Py	117	Educational Psychology	3
Subject concentration (if psychology, only 8) of 24			
		Total	41

Option B—Nursery School Teachers

Cf	120	Creative Activities for the Young Child	3
Cf	121	Foundations for Academic Learning	3
Cf	153	The Younger Child in Home & in School	3
Cf	155	The Adolescent and His Family	3
Cf	260	Seminar in Child Development	3
Ed	B2	The American School	3
Py	117	Educational Psychology	3
		Psychology Electives	9
		Total	30

Option C—Social Service Work in Child Development and Family Life

Cf	155	The Adolescent & His Family	3
Cf	211 or	Seminar in Family Relationships	
Cf	260	Seminar in Child Development	3
Hm	81	Home Management Principles & Theories	3
Hm	82	Management in Homes	2
Hm	191	Housing	3
Py	130	Social Psychology	3
Py	133	Abnormal Psychology	3
Sy	3/4	Intro. to Sociology	6
Sy	24 or	Sociology of Rural Life	
Sy	126	Sociology of Urban Life	3
Sw	150/151	Social Welfare	6
Sw	152	Social Work as a Profession	3
Sw	154	Field Experience in Social Work	2
		Total	40

Option D—Kindergarten Teachers

Cf	119	Supervised Activities for the Young Child	8
Cf	120	Creative Activities for the Young Child	3
Cf	121	Foundations for Academic Learning	3
Cf	122	Program Planning in the Kindergarten	3
Ed	B2	The American School	3
		Total	20

FAMILY RELATIONSHIPS SPECIALIST

Cf	2	Patterns of Interpersonal Behavior	3
Cf	3	The Preschool Child	3
Cf	4	The Young School Child	3
Cf	109	Special Problems in Child Development	3
Cf	111	Family Relationships	3
Cf	155	The Adolescent and His Family	3
Cf	211	Seminar in Family Relationships	3
Cf	260	Seminar in Child Development	3
Cf	285	New Findings in Child Development and Family Relationships	3
Fn	41	Intro. to Food and Nutrition	3
Cd	31	Design	3
or			
Hm	191	Housing	3
Hm	185	The Family's Financial Problems	3
		Total	36

Those interested in teaching at the secondary level or social service work should check with the School of Home Economics for additional requirements.

HOME ECONOMICS EDUCATION

To meet certification requirements for home economics teacher in the secondary school.

General education (34 hours from basic core)	50 hours
Professional	19 hours

He	71	Tech. in Teaching Home Ec.	2
He	72	Curr. Dev. in Home Ec.	3
Ed	B2	The American School	3

He	176	Adult Education	3
or			
He	180	Evaluation	3
He	73	Supervised Student Teaching	8

Home Economics — 40 hours

Child Delevopment & Family Relationships	8
Clothing & Textiles	8
Foods & Nutrition	8
Housing, Home Furnishings & Equipment	8
Family Economics & Management	8

GENERAL HOME ECONOMICS

40 hours

The 40 hours of home economics courses as required under Home Economics Education

It is recommended that additional hours be elected in either Clothing and Textiles or Foods and Nutrition.

COURSES IN THE SCHOOL OF HOME ECONOMICS

Child Development and Family Relationships (Cf)

2. Patterns of Interpersonal Behavior—Observations and study of interpersonal relations of young children are used as a basis for understanding human relations (and the "self"). Laboratory experience in the nursery school. *Rec* 2, *Lab* 2, *Cr* 3. Open to freshmen. STAFF

3. The Preschool Child—Development of children from infancy through the preschool years and factors affecting it. Special emphasis on the role of the family. Laboratory experience in the nursery school. Prerequisite or parallel: Py 1. *Rec* 2, *Lab* 2, *Cr* 3.

4. The Young School Child—Developmental study of children of six through 12 years of age. Influencing factors, especially home and school, are given special consideration. Laboratory observations in nursery school and public schools. Prerequisite or parallel: Py 1, *Rec* 2, *Lab* 2, *Cr* 3.

109. Special Problems in Child Development — Prerequisite or parallel: a Cf course or Py 67. *Cr* 1-3. STAFF

111. Family Relationships — Interpersonal relationships in marriage preparation, courtship, choosing a mate, engagement. Husband-wife relationships in fulfilling physical, emotional, social, intellectual, spiritual needs. Parent-child relationships. Prerequisite: Sophomore. *Cr* 3. MR. RICE

119. Supervised Student Teaching in a Selected School—Prerequisite: Cf 120, 121. *Cr* 8.

120. Creative Activities for The Young Child—Contributions of the areas of play, art and music to the development of creativity in children 3 to 8 years of age. Experience with children in all three areas. Prerequisite: junior standing. Cf 2, 3 or equivalent. *Cr* 3.

121. Foundations for Academic Learning — Readiness programs for the kindergarten and primary child in four academic areas: reading, numbers, science and social science. Prerequisite: junior standing. Cf 4, 120. *Cr* 3.

122. Program Planning in the Kindergarten — Consideration of basic teacher responsibilities and skills necessary for effective teaching of kindergarten children. Prerequisite: senior standing. Cf 121, Ms 107, 108, Edm 13 or 18. *Cr* 3.

153. The Younger Child in Home and School—Developmental aspects of psychological, physiological, and social growth of children through the elementary school years. Integrative use of home, school, and community resources for guiding the development of the child. Prerequisite: courses in psychology or permission. *Cr* 3. STAFF

155. The Adolescent and His Family—The problems of youth and the role of parents, teachers and leaders in guiding him toward physical, intellectual, social, emotional, and spiritual maturity in the family, school, church, and community. Undergraduate or graduate credit. *Cr* 3. MR. RICE

215. Sex Education of the Child from 5 to 12—Why, what, when, and how of sex education based upon knowledge of the psycho-sexual-social development of the child. Methods, materials, curricula useful at home and in the classroom. Undergraduate or graduate credit. *Cr* 3. MR. RICE

216. Family Life and Sex Education of Youth—The roles of the home, school, community in preparing youth for marriage and family living. Goals, content, methods, materials, and curricula in family life and sex education of junior high and senior high youth. Undergraduate or graduate credit. *Cr* 3. MR. RICE

Clothing and Design (Cd)

22. Principles of Clothing Construction—Principles involved in clothing construction with application to garments; practice in communications of principles for teaching. *Rec* 1, *Lab* 4, *Cr* 3. MISS LAFFERTY

25. Textiles—Fibers, yarns, fabrications, finishes, labels; end-uses in home and clothing. Consumer education and protection. *Rec* 3. *Cr* 3. MISS LAFFERTY

31. Design—Experiments with line, form, color, texture, and light as media of daily living in clothing and home furnishings. Components of quality in commercial products. Practice in criticism. Composition in natural and commercial materials. *Rec* 2, *Lab* 2, *Cr* 3. MR. DAHL

32. Creative Design—Organization of elements of design in two and three dimensions in various media for uses such as decorative arrangements, merchandise display, and educational visuals. *Lab* 4, *Cr* 2. MR. DAHL

33. Applied Textile Design — Application of design principles to such textile problems as block printing, batik, decorative needlework, and hand weaving. Prerequisite: Cd 31 or 32, or permission. *Lab* 4, *Cr* 2.

38. Special Problems in Design—*Cr* 1-3. MR. DAHL

39. Special Problems in Interiors—*Cr* 1-3. MR. DAHL

124. Creativity in Clothing Construction—Development of three dimensional form in constructing tailored garments, in manipulating basic patterns for garment design, and in draping. Prerequisite: Cd 22 or permission of instructor. *Rec* 1, *Lab* 4, *Cr* 3. MISS LAFFERTY

128. Seminar: Dress in Human Development—Dress as an aspect of our cultural heritage. Interaction of values, goals, and norms as evidenced in uses of dress throughout life. *Rec* 3, *Cr* 3.

129. Special Problems in Clothing and Textiles—*Cr* 1 to 3.

192. Interior Design and Home Furnishings—Focus on individuality and family situations in relation to functional and esthetic qualities of the home. Selection, arrangement, and evaluation of settings and furnishings. *Rec* 2, *Lab* 2, *Cr* 3. MR. DAHL

Food and Nutrition (Fn)

41. Introduction to Food and Nutrition — Study of human nutritional needs. Emphasis on the selection of food to meet these needs, considering economy of time and money. *Rec* 3, *Cr* 3. STAFF

42. Family Food Management—Analysis of the criteria for making intelligent food choices. Application of those standards in the planning of family meals. Limited amount of food preparation and service. *Rec* 2, *Lab* 2, *Cr* 3. STAFF

43. Experimental Foods—An experimental approach to the preparation of foods. Emphasis on the scientific interpretation of results. Prerequisite: En 42 and Bc 8 or equivalent. *Rec* 2, *Lab* 4, *Cr* 4. STAFF

51. Nutrition for Nurses—An elementary consideration of the principles of nutrition as applied to the feeding of normal individuals of all ages. For three-year nursing students. *Rec* 2, *Cr* 2. STAFF

61. Quantity Food—Principles basic for retention of nutritive value and quality in the production and service of quantity food; preparation techniques; recipe standardization; portion control; sanitation and use and care of equipment. Prerequisite: Fn 43, *Rec* 2, *Lab* 2, *Cr* 3. MISS YOUNG

62. Food Service Management—Organization structure, efficient methods, and controls utilized by management in menu planning, purchasing, receiving, storing, preparing and serving food and beverages. Prerequisite: Fn 43, *Rec* 2, *Lab* 2, *Cr* 3. MISS YOUNG

63. Food Service Administration and Cost Control—Supervised administration of selected food services. Theory of cost control; pricing; techniques for controlling costs through standardized procedures, purchasing practices, efficient management, and training of personnel. Prerequisite: Fn 62. *Rec* 2, *Lab* 2, *Cr* 3. MISS YOUNG

149. Special Problems in Foods—*Cr* 1-3. STAFF

152. Human Nutrition—Body metabolism and requirements for nutrients by normal individuals. Prerequisite: Bc 8, and Zo 8 or equivalent. *Rec* 3, *Cr* 3. MISS THORNBURY

‡***155. Nutrition in Abnormal Conditions***—Principles involved in adjusting diets for diseases and abnormal conditions that may be benefited by variations from normal diets. Prerequisite: Fn 52. *Rec* 3, *Cr* 3. STAFF

258. Seminar in Nutrition—Reports and discussions of recent developments in nutrition and related fields. Special attention to critical analysis. Prerequisite: Fn 152 or equivalent. *Rec* 1-2, *Cr* 1-2. MISS THORNBURY

259. Special Problems in Nutrition—*Cr* 1-3. STAFF

300. Readings in Nutrition—Critical review of the literature on energy metabolism, proteins, lipids, minerals, and vitamins. Attention to historical basis of present knowledge and to interpretation and application of experimental data. Content will vary, and the course may be repeated with credit. Background in biochemistry and physiology required. *Cr* 2-3. MISS THORNBURY

Home Economics Education (He)

70. Senior Seminar in Home Economics—History, philosophy, present organization, and future development of professional home economics. *Rec* 1, *Cr* 1. STAFF

71. Techniques in Teaching Home Economics — Selection and use of teaching methods, techniques, and materials to promote development of concepts and thinking processes in the classroom. Observation of home economics classes in junior and senior high schools. Prerequisite: junior standing. *Lab* 4, *Cr* 2.
STAFF

72. Curriculum Development in Home Economics Education—Current educational philosophies, principles, and practices; their application to home economics education through program planning and curriculum development. Prerequisite: He 71 concurrently, or permission. *Rec* 3, *Cr* 3. STAFF

73. Supervised Student Teaching—Concept development in selected subject areas with attendant unit development. Problems pertinent to teaching home economics. Observation, participation, and teaching in a selected junior or senior high school in the state, under immediate direction of the local teacher with supervision from University staff. Evaluation of this experience. Students live in the school communities for eight weeks. Prerequisite: He 72. *Cr* 8. STAFF

He/EdL 151. Organization and Administration of Adult Education—The organization, financing, staffing, promotion, and evaluation of programs of adult education. Teaching resources and the role of the adult education administrator are given major emphasis. Prerequisite: advanced undergraduate or graduate standing. *Cr* 3. MR. AXFORD

†***176. Adult Education***—Need for and purpose of adult education programs. Consideration of learning program development, organization, and administration of programs. Emphasis on adult education through the public schools. Cooperative Extension Service, and community agencies. *Rec* 3, *Cr* 3. STAFF

†***180. Evaluation***—Theory and basic principles of evaluation. Methods of evaluating progress towards goals; development of evaluative devices and the use of findings. Prerequisite: senior standing. *Rec* 3, *Cr* 3. STAFF

EdM 180/EdM 181. Teaching in Adult Education—A critical examination of major problems of teaching and learning in adult education. Emphasis on factors that affect learning ability, achievement, and motivation to learn through the adult life cycle. Prerequisite: advanced undergraduate standing. *Cr* 3.
MR. AXFORD

279. Special Problems in Home Economics Education—*Cr* 1-3.

399. Graduate Thesis—*Cr Ar.* STAFF

Home Management and Housing (Hm)

81. Home Management Principles and Theory—Analysis of the managerial process and its relationship to decision making. Emphasis is placed on the use of resources including time and energy to attain family goals. *Rec* 3, *Cr* 3.
MRS. SCHOMAKER

82. Management in Homes—Experience with families in observing different ways they manage resources to achieve goals. Work with families of various socio-economic levels toward solving management problems. Field trips included. *Rec* 1, *Lab* 2, *Cr* 2. MRS. HUTCHINSON

89. Special Problems in Home Management—*Cr* 1-3.

93. Equipment—Elementary principles of physics as a basis for understanding the selection, operation, care and maintenance of equipment. Prerequisite; junior standing. *Rec* 2, *Lab* 2, *Cr* 3. MRS. SCHOMAKER

185. The Family's Financial Problems—Influence of outside economic conditions and personal circumstances on family financial problems. The management process applied to family problems involving finances—economic position, meeting current living costs, protection against financial contingencies, credit, developing a savings and investment program, legal aspects of transactions. Prerequisite: junior standing or by permission. *Rec* 3, *Cr* 3. MRS. DALTON

191. Housing—Physical, social and emotional aspects of the housing environment. Floor plan principles in relation to family life cycle. Local government controls; natural problems in housing. Prerequisite: junior standing. *Rec* 2, *Lab* 2, *Cr* 3. STAFF

COURSES GIVEN ON DEMAND

The following courses are given when there is sufficient demand during the academic year, through the Continuing Education Division, or in Summer Sessions.

Child Development and Family Relationships (Cf)

211. Seminar in Family Relationships—Reports and discussions of current literature in family relationships and related social sciences with special attention to critical analysis. *Cr* 3.

260. Seminar in Child Development—Reports and discussions of research findings in child development. *Cr* 3.

285. New Findings in Child Development and Family Relationships—Recent findings in child development and family relationships selected to help teachers interpret children's interaction and adjustment to peers, to family, to school and to society. *Cr* 2.

Clothing and Design (Cd)

26. History, Market, and Analysis of Clothing—Styles of dress across space and time. Influences of mass market and end-use on garment design. Levels of quality, components of satisfaction, research developments. Prerequisite: junior standings. *Rec* 3, *Cr* 3.

123. Clothing Construction Analysis—Consumer analysis and alteration of manufactured garments. Survey of unfamiliar fabrics and construction processes. Problems based on background and professional needs of students. Prerequisite: Cd 22 or permission. *Lab* 4, *Cr* 2.

141. Seminar on Consumer Problems in Textiles and Clothing—Needs and satisfactions of individuals and families as to clothing and textiles in a variety of managerial, technological, personal, and social situations. Informative labeling and consumer protection. Properties and care of new fibers, fabrications, finishes. Prerequisite: undergraduate courses in textiles and clothing or permission. *Rec* 3, *Cr* 3.

Food and Nutrition (Fn)

69. Special Problems in Food Service Management—Individual investigation of aspects of institutional management. Emphasis on advanced problems in standardization, marketing, quality base for food cost, and/or personal management. Prerequisite: Fn 62 or permission. *Cr* 1-3.

145. Recent Advances in Food and Nutrition—Results of recent research and trends in food and nutrition. Emphasis on their significance for professional home economists. Prerequisite: a nutrition course or permission. *Rec* 3, *Cr* 3.

148. New Developments in Foods—Developments in food processing and marketing; overview of world food situation. Social and economic influence of trends on meal patterns, human satisfactions, and food management. *Rec* 3, *Cr* 3.

156. The Nutrition of Children—Relationship between nutrition and growth. Study of newer findings on nutritional requirements of children from infancy through adolescence. Prerequisite: a course in nutrition or chemistry and physiology, aceptable to instructor. *Cr* 2.

257. Modern Concepts in Food and Nutrition—Selected basic knowledge, principles, and concepts in the area of food and nutrition; adaption for use at various age levels in diverse educational situations. Prerequisite: permission. *Cr* 3.

Home Economics Education (He)

75. Advanced Home Economics Education—Current philosophy of teaching home economics; concept development in selected areas of the field with attendant unit development. Study of department management selection and use of space and equipment, and other pertinent problems related to teaching home economics in secondary schools. *Cr* 3.

90. Methods of Teaching Home Economics — Study of methodology effective in teaching at different development levels, in several subject areas, according to objectives of programs. Experimentation in methods and teaching aids, considering class size and time schedule. Emphasis on creative teaching. Review of research in methodology. *Rec* 3, *Cr* 3.

111. Supervision of Student Teaching in Home Economics—Theory and principles of supervision for improved educational programs; procedures for improved communication between supervisor and other personnel; evaluation of growth within individuals and programs. *Cr* 3.

Note: Designed for supervisory teachers, city/county/state supervisors, extension agents, and others in a supervisory capacity. Supervising teachers participating in student teaching programs do so on an invitational basis. They must participate in a workshop or institute on the application of supervision theory to student teachers following a course which includes supervision principles and theory. These workshops will be sponsored by the institution with which the teacher will work.

320. Seminar in Home Economics Education—*Cr* 3.

Home Management (Hm)

186. Management of Household Resources—Current philosophy and literature in the field with respect to use and interaction of time, energy, money, and other resources. *Rec* 3, *Cr* 3.

187. The Consumer in the Present Economy—Distribution of consumer goods through the marketing system, change of marketing institutions; consumer information available, and consumer protection in the market. Emphasis on joint interest of those in marketing, the consumer, and the government in an efficient marketing system. *Rec* 3, *Cr* 3.

199. Special Problems in Housing—*Cr* 1-3.

PLANT AND SOIL SCIENCES

PROFESSORS STRUCHTEMEYER, BROWN, HUTCHINSON, E. MURPHY, STILES, TREVETT; ASSOCIATE PROFESSORS CARPENTER, HEPLER, LOTSE, KOCHER, H. MURPHY, WAVE; ASSISTANT PROFESSORS ISMAIL, LANGILLE, LITTLEFIELD, ROURKE; EXTENSION SPECIALISTS ERHARDT, HOLYOKE; COLLABORATOR EPSTEIN

The curriculum in the Department of Plant and Soil Sciences has been organized to provide a well-balanced educational program for students interested in the study of plants, soils and natural resources. The program provides students with a knowledge of basic sciences, soils, plants, landscaping and natural resources.

Students with primary interest in soils can get specialized training in soil fertility, conservation, chemistry, physics and classification. Those with an interest in plants can obtain training in forages, fruits, vegetables, ornamental horticulture and landscaping. Students can also obtain training in the management and conservation of natural resources.

Upon meeting the requirements established by the University and the department, students will receive a B.S. degree in plant and soil sciences. Training received will qualify the student for careers in teaching, extension work, production and service functions for industry, Soil Conservation Service and other related government agencies, farming, landscaping, consulting, inspections, communications and sales.

Students who are well qualified and are interested in doing graduate work should plan early to go beyond the B.S. degree. Graduate programs at the M.S. and Ph.D. levels are available and qualified students should be encouraged to continue their education for an advanced degree.

Curriculum in Plants or Soils

Required Courses		Credit Hours	Min. Degree Hours Required
A. ORIENTATION			0
B. BASIC SCIENCES			36
Ch 11-12 or 13-14	Chemistry	8	
Bc 21 & Bc 122	Organic & Biochemistry	8	
Bt 1	Botany	4	
Bt 153	Plant Physiology	4	
Ms 4 or 12	Mathematics	3(4)	
Zo 163	Genetics		
or			
Gy 6	Geology	3	
Ps 6	Physics	5	
C. PLANTS AND SOILS			28
P21	Crop Science	3	
P22	Crop Management	4	
P173 & 174	Seminar	2	
S2	Soil Science	4	
S51	Soil Fertility	3	

S154	Soil-Plant Relationships	3	
	(Plant Sequence)		
	Additional plant courses	6	
	Departmental electives	3	
	or		
	(Soil Sequence)		
	Additional soils courses	6	
	Departmental electives	3	
D. LIFE SCIENCES AND AGRICULTURAL ELECTIVES			12
E. COMMUNICATIONS			9
Eh 1	Freshman Composition	3	
Eh 17	Adv. Prof. Writing	3	
Sh 1	Intro. to Oral Communication	3	
F. HUMANITIES AND SOCIAL SCIENCES			15
Minimum of two semester courses in each			
G. FREE ELECTIVES			20
Any course in the University for which the student is qualified.			
Minimum Degree Hours for Graduation			**120**

NATURAL RESOURCES MANAGEMENT
(Option)

The curriculum for the Natural Resources option in the department has the same basic science, communications and humanities and social sciences requirements as listed for plant or soil options. There are required 54 hours in Natural Resource courses instead of courses in category "C." Plant and Soils. These are:

Physical Geology
Crop Science
Soil Science
Soil and Water Conservation
Soil-Plant Relationship
Animal Biology
Wildlife Ecology
Natural Resources
Land Resource Economics
Resource Use and Economic Growth
Botany
Plant Ecology
Biological Oceanography
Legal Environment of Business

Soils Courses (S)

2. Soil Science—A study of the chemical, physical and biological properties of soil. Also considers origin, management, and inter-relationships of soils to plant growth. Prerequisite: Ch 1 or Bc 7. *Rec* 3, *Cr* 3, or *Rec* 3, *Lab* 2, *Cr* 4.
MR. HUTCHINSON

3. Forest Soil Science—Fundamentals of soil science including the study of development, properties, and management of soils and the inter-relationships of soils to forest growth. Prerequisite: Ch 1, *Rec* 2, *Lab* 2, *Cr* 3.

MR. STRUCHTEMEYER

21. Earth Science—Comprehensive study of the effects of natural forces on soil, atmosphere, climate, oceans, and land forms. *Rec* 3, *Cr* 3. MR. MURPHY
Offered in CED only

‡***50. Soil and Water Conservation***—Management of our soil and water resources in accordance with need and capabilities of the land. Prerequisite: S 2 or S 3. *Rec* 2, *Cr* 2. MR. STRUCHTEMEYER

51. Soil Fertility—A study of soil as a source of the essential nutrients needed for plant growth and the properties and use of fertilizers, liming materials, and manures. Prerequisite: S 2 or S 3. *Rec* 3, *Cr* 3. MR. HUTCHINSON

***122. Earth Science II* (for secondary school teachers)**—An introduction to astronomy and the earth sciences of meteorology and soils, with emphasis on basic principles. *Cr* 3. MR. HARPER, MR. TODD AND MR. MURPHY

†***152. Soil Development and Classification***—Genesis, morphology, classification, and mapping of soils. Interpretation of soil survey reports. Prerequisite: S 2 or S 3 and Gy 1a. *Rec* 2, *Lab* 3, *Cr* 3. MR. ROURKE

†***154. Soil - Plant Relationships***—Chemical properties of soils and plants with principles and methods of analyses. Prerequisite: S 2 or S 3 and S 51. *Rec* 2, *Lab* 3, *Cr* 3. MR. LOTSE

‡***156. Physical Properties of Soils***—An intensive consideration of the physical properties of the soil and their effect on plant growth. Prerequisite: S 2 or S 3 and Ps 1, 3 or 6. *Rec* 2, *Lab* 3, *Cr* 3. MR. EPSTEIN

157. 158. Problems in Soils—Opportunity is provided for specialization in specific areas of soil science. *Cr Ar.* STAFF

203. Radiobiology—Principles for using radioisotopes in biological research. Permission of instructor. *Rec* 2, *Lab* 4, *Cr* 4. MR. LANGILLE

252. Spectrochemical Analysis—The theory and practice of colorimetry, flame photometry, spectroscopy and other allied instruments in quantitative chemical analysis. Permission of instructor. *Rec* 2, *Lab* 4, *Cr* 4. MR. CARPENTER

‡***254. Chemistry of Soils***—Colloquia and laboratories on chemical transformation in soils, chemical relationships of soils and plants, and effects on organic and inorganic plant nutrition. Prerequisite: S 2, S 51, S 54, and Ch 41. *Rec* 2, *Lab* 4, *Cr* 4. MR. LOTSE

271. Experimental Design—Principles of research in biological sciences, design of experiments, statistical analyses and interpretation of data. Permission of instructor. *Rec* 3, *Lab* 2, *Cr* 4. MR. HEPLER

399. Graduate Thesis—*Cr Ar.*

Plant Courses (P)

1. Horticulture—A course on general horticultural practices pertaining to: home landscaping; the flower, vegetables, and fruit gardens; the hobby greenhouse, plant propagation; and the various cultural aspects related to the home grounds. *Rec* 3, *Cr* 3. MR. LITTLEFIELD

21. Crop Science—Application of environmental sciences to growth of agricultural crops. Response of crops to moisture, temperature, light and soil

fertility. Effects of weeds, diseases and insect pests. Prerequisite: Bt 1. *Rec* 3, *Cr* 3. MR. BROWN

22. Crop Management—Principles and practices in the management of selected crops. (1) Agronomic and vegetable crops; (2) fruit crops; (3) ornamental plants. Prerequisite: P 21 or permission. *Rec* 4, *Cr* 4. MR. MURPHY

P/AnV 43. Tropical Agriculture—A consideration of the characteristics and problems of the soils, plants, and animals of the tropics. Programs and methods for stimulating their potential productivity will be explored. *Rec* 3, *Cr* 3.

†***165. Post Harvest Physiology and Storage***—Discussion of biochemical and physiological processes associated with ripening and keeping quality of harvested plant products. Includes temperature, humidity, types of storage, handling and physiological disorders. Prerequisite: Bt 153 or permission. *Rec* 2, *Lab* 2, *Cr* 3.

166. Plant Propagation—The principles and methods involved in the propagation of herbaceous and woody plants by seeds, division, layering, cutting, budding, and grafting. Prerequisite: Bt 153 and either P 30, P 163, P 164, or P 169. *Rec* 2, *Lab* 2, *Cr* 3.

167. 168. Problems in Plant Science — Persons wishing to specialize in potatoes, vegetable crops, forage crops and pomology can do so by developing problems in their areas of interest. *Cr Ar.* STAFF

173/174. Seminar—Review of literature, problems, and research as related to the areas of plants and soils. *Rec* 1, *Cr* 1. STAFF

‡***201. Plant Growth Regulators***—Concepts and techniques in the study of plant growth and development with emphasis on phytohormones and synthetic growth substances in relation to economic plants. Prerequisite: Bt 153. *Rec* 3, *Lab* 3, *Cr* 3.

202. Plant Breeding—Improvement of plants through hybridization and selection. Genetic principles as related to breeding methods will be discussed. Prerequisite: Bt 145. *Rec* 3, *Cr* 3. MR. HEPLER

399. Graduate Thesis—*Cr Ar.* STAFF

Ornamental Horticulture and Landscaping Courses

30. Ornamental Horticulture — Principles of growing ornamental plants in the home, small greenhouse, and on home grounds. *Rec* 2, *Lab* 2, *Cr* 3.

‡***31. Landscape Plant Material***—Study of the woody plants suitable for landscape design in New England including their selection, arrangement, planting, and care. Prerequisite: junior or senior standing. *Rec* 2, *Lab* 2, *Cr* 3.

33. Greenhouse Management—The application of plant growing science to commercial production under glass, placing special emphasis on plant growing, marketing, and care of the commercial range. Field trips. *Rec* 3, *Lab* 2, *Cr* 4. MR. LITTLEFIELD

‡***34. Agrostology***—The identification, fertilization, mowing, pest control, and soil requirements of grasses suitable for use on lawns, golf courses, athletic areas, cemeteries and parks. Prerequisite: S 2. *Rec* 3, *Cr* 3. MR. HOLYOKE

†***35. Landscape Designing***—Principles of landscape design as applied to the home and institutional grounds; experience provided in preparing landscape plans. Prerequisite: Eg 1 or its equivalent or permission of instructor. *Rec* 2, *Lab* 2, *Cr* 3. MR. CLAPP

SPECIAL PRE-PROFESSIONAL PROGRAMS IN AGRICULTURAL EDUCATION, DAIRY MANUFACTURING FOOD PROCESSING, AND PRE-VETERINARY

A. Agricultural Education

The University offers the first two years of a four-year professional curriculum to prepare for teaching high school vocational agriculture. The last two years of the curriculum may be secured at the University of New Hampshire under provisions of a cooperative agreement whereby Maine students may enroll at the New Hampshire resident tuition rate.

The following is a recommended two-year course of study to be taken at the University of Maine by students contemplating a major in Agricultural Education. The last two years of the four-year sequence must be taken at the University of New Hampshire.

Two-Year Pre-Agricultural Education Curriculum

First Year

FALL SEMESTER				SPRING SEMESTER			
Course			Credit Hours	Course			Credit Hours
LSA	1	University Life	0	Ch	12	Gen. Chemistry	4
AnV	45	Animal Science	3	P	1	Horticulture	3
Bt	1	Gen. Botany	4	S	2	Soils	4
Ch	11	Gen. Chemistry	4	Zo	3	Animal Biology	4
Eh	1	Freshman Comp.	3	Pe	2	Physical Education	0
Pe	1	Physical Education	0				
			14				15

Second Year

AE	36	Farm Power	3	AE	32	Farm Struct. & Equip.	3
AnV	49	Livestock Feeding	3	#Ms	4	Algebra and Trigonometry	3
Ec	1	Prin. of Economics	3	Py	2	Gen. Psychology	3
Py	1	Gen. Psychology	3	P	21	Crop Science	3
Sh	1	Oral Communication	3	Elective		(En 26 or Ps 6 ro humanities)	3(4)
			15				15 (16)

#Ms 4 is not required if the student completed two years of high school algebra, one year of plane geometry, and one half year of trigonometry.

B. Pre-Veterinary

The University of Maine does not offer a degree in veterinary medicine. Most students interested in this field attend four years as candidates for the B.S. degree. A few students gain admittance to a veterinary college after three years of pre-veterinary studies and the occasional student qualifies for admittance after two years of pre-veterinary study. This pattern is not peculiar to Maine alone, but is the trend nationally.

To help guide the prospective student interested in veterinary medicine, the following curricula is suggested for the first two years. Adjustments in the selection of courses can be made to fit special requirements of particular veterinary colleges. In addition to those courses listed below, the student should consider adding the following courses to their program: botany, calculus, German, comparative anatomy, and embryology.

Two-Year Pre-Veterinary Curriculum

Freshman Year

		Subject	Credit Hours
LSA	1	University Life	0
AnV	45	Animal Science	3
Ch	11	General Chemistry	4
Ay	1	Anthropology	
		or	3
My	1	Modern Society	
Ms	4	Algebra & Trigonometry	3
Pe	1	Phys. Education	0
Zo	3	General Zoology	4
			17

		Subject	Credit Hours
Ch	12	General Chemistry	4
Eh	1	Freshman Composition	3
Ay	2	Anthropology	
		or	3
My	2	Modern Society	
Pe	2	Phys. Education	0
Zo	4	General Zoology	
		or	4
Bt	1	General Botany	
		Electives	2
			16

Sophomore Year

		Subject	Credit Hours
Bc	21	Organic Chemistry	4
Eh	3	English Literature	
		or	3
Eh	7	Advanced Composition	
AnV	160	An. Genetics & Breeding	
		or	3
Zo	162	Principles of Genetics	
Ps	1a	General Physics	4
		Humanities Elective	2
			16

		Subject	Credit Hours
Bc	122	Biochemistry	4
Hy	4	U.S. History	3
Ps	2a	General Physics	4
Sh	1	Oral Communication	3
Sh	9	Parliamentary Procedure	1
		Elective from Humanities	1
			16

C. Dairy Manufacture

A cooperative agreement with the University of Vermont offers an opportunity for students to secure training in dairy manufacturing. The first two years of a four-year course are offered at the University of Maine. The final two years are completed at the University of Vermont. Residents of Maine are admitted to the University of Vermont for the last two years of the course at the Vermont resident tuition rate. The first two years of this program at Maine are supervised by the Department of Animal Sciences.

D. Food Processing

As a part of the New England Board of Higher Education plan for regional cooperation, the first two years of a program in Food Science and Technology may be taken at the University of Maine and the final two years of specialized training completed at the University of Massachusetts. Residents of Maine are admitted to the University of Massachusetts for the last two years at the Massachusetts resident tuition rate. The first two years of the program at the University of Maine are supervised by the Department of Food Science.

Alternately, students wishing to major in the biological sciences with specialization in Food Science may do so at the University of Maine by enrolling in the Biology program (Food Science Option), described on page 241.

Two-Year Pre-Food Science and Technology Curriculum

Freshman Year

FALL SEMESTER				SPRING SEMESTER			
Subject			Credit Hours	Subject			Credit Hours
LSA	1	University Life	0	ARE	42	World Population	3
Ch	11			Ch	12		
or	13	Chemistry	4	or	14	Chemistry	4
Ms	4	Algebra & Trigonometry	3	Ms	12	Analytical Geometry and Calculus	4
Bt	1	General Botany	4				
Eh	1	Freshman Composition	3	Zo	3	Animal Biology	4
Pe	1	Physical Education	0	Pe	2	Physical Education	0
			14				15

Sophomore Year

Ch	151	Organic Chemistry Lecture	3	ARE	48	Principles of Ag. Economics	3
Ch	161	Organic Chemistry Laboratory	2	Ch	140	Quantitative Analysis	4
		or		Ch	152	Organic Chemistry Lectures	3
Bc	21	Biochemistry	4	Ch	162	Organic Chemistry Laboratory	2
By	127	Bacteriology	3			or	
By	128	Bacteriology	2	Bc	122	Biochemistry	4
Ps	1a	Physics	4	Ps	2a	Physics	4
Sh	1	Oral Communication	3				
			16-17				15-16

TWO-YEAR TECHNICAL DIVISION
COLLEGE OF LIFE SCIENCES AND AGRICULTURE

ASSOCIATE DEAN WINSTON E. PULLEN

The basic objectives of educational programs in the Two-Year Technical Division are: 1) to provide a practical working knowledge of fundamental principles in specific technical fields which will develop competence for gainful employment; 2) to develop competence in written and oral communication; 3) to contribute to the development of the student's intellectual capacity and personal growth; and 4) to prepare graduates for roles as citizens and effective community leaders. The program is not intended as preparatory course for four-year professional curricula and students are discouraged from entering the program with this objective. However, a transfer procedure is maintained for students whose educational objectives change and who demonstrate superior academic abilities.

Course offering in the technical program are distinct and separate from those offered for baccalaureate degree students. Technical courses are of a practical nature and place emphasis upon the development of skills for immediate application. Instruction is provided by regular University staff who are specialists in their fields. Laboratory instruction and field experience represent an essential part of the technical training program.

An associate of science degree is awarded to graduates of the program. Requirements for this degree include the satisfactory completion of a prescribed technical curriculum with a minimum of 64 credit hours earned at an accumulative grade average of at least 1.80.

Seven curricula or options are offered covering a variety of fields of study.

A basic core curriculum of general education subjects is required in most programs, along with the technical subjects.

BASIC CORE CURRICULUM

All students enrolled in Two-Year Technical Division are expected to complete the following group of courses representing a basic core requirement:

	Subject	Hours
1 LSA	University Life	0
13 LSA*	Applied Mathematics	3
1 Eh-2 Eh*	English Composition	6
2 Pol*	State & Local Government	3
3 Pol*	Current World Affairs	2
Pe 1-Pe 2	Physical Education	0
1 Sh	Oral Communication	3
		17

* Students (except those in Forest Management) failing to pass a preliminary examination will be required to take a remedial course in mathematics (7 LSA) without credit. Students in the Animal Medical Technology program are not required to take 2 Eh, 2 Pol, & 3 Pol.

I. Business Management Curricula

These curricula provide concentrated and practical training in preparation for business management careers in food and fiber industries and associated businesses. Students will be prepared for managerial positions in food stores and other types of retail establishments, for supervisory roles in food processing, wholesaling and distributing business, and for a variety of other types of employment in sales, service, and management work.

Students desiring management careers in food production are provided technical training in crop and livestock production to supplement training in business management.

Students will have an opportunity to participate in a supervised "on-the-job" training program for practical business experience during the summer between the first and second year.

1) *Agricultural Business Management*—provides training in business management and in farm technology for employment opportunities with farm-related business enterprises.

2) *Food Industry Management*—training includes the basic principles of business management plus the essentials of food technology and prepares for employment opportunities with firms engaged in food processing, packaging, wholesaling, and retailing.

3) *Horticultural Management*—provides knowledge and skills needed in the production of horticultural and oramental plants along with an understanding of the principles of business management.

AGRICULTURAL BUSINESS MANAGEMENT

			Required Hours
A. Basic Core Curriculum			17
B. Department Core Curriculum			33
1. *Sociology*			5
6 ARE	Dynamics of Human Behavior	3	
7 ARE	Sociology and The Individual	2	
2. *Business and Economics*			18
2 ARE	Introduction to Economics	3	
3 ARE	Farm Management	3	
4 ARE	Principles of Marketing	3	
8 ARE	Principles of Accounting	3	
12 ARE	Introduction to Statistics	3	
28 ARE	Interpretation of Financial Records	3	
3. *Agricultural Technology*			10
16 Ae	Work Simplification	3	
1 En	Applied Entomology	3	
2 P	Soils and Fertilizers	4	
C. Free Electives			14
		Total	64

FOOD INDUSTRY MANAGEMENT

			Required Hours
A. Basic Core Curriculum			17
B. Department Core Curriculum			38
1. *Sociology*			5
6 ARE	Dynamics of Human Behavior	3	
7 ARE	Sociology and The Individual	2	
2. *Business and Economics*			22
2 ARE	Introduction to Economics	3	
4 ARE	Principles of Marketing	3	
8 ARE	Principles of Accounting	3	
12 ARE	Introduction to Statistics	3	
20 ARE	Managing the Business Firm	3	
24 ARE	Food Distribution Management	4	
28 ARE	Interpretation of Financial Records	3	
3. *Food Technology and Handling*			11
16 Ae	Work Simplification	3	
2 Bc	Food Chemistry	4	
2 By	Food Bacteriology and Sanitation	4	
C. Free Electives			9
		Total	64

HORTICULTURAL MANAGEMENT

			Hours	Required Hours
A.	**Basic Core Curriculum**			17
B.	**Business, Economics, and Sociology**			20
	2 ARE	Introduction to Economics	3	
	4 ARE	Principles of Marketing	3	
	8 ARE	Principles of Accounting	3	
	10 ARE	Sales Promotion	3	
	28 ARE	Interpretation of Financial Records	3	
	6 ARE	Dynamics of Human Behavior	3	
	7 ARE	Sociology and The Individ ıal	2	
C.	**Horticultural Technology***			24
	1 Bt	Introductory Botany	3	
	1 En	Applied Entomology	3	
	2 S	Soils and Fertilizers	4	
	7 P	Home Grounds Inmprovement	3	
	8 P	Turf Management	2	
	9 P	Post-Harvest Physiology of Fruits and Vegetables	3	
	4 P or 5 P	Fruit Production Vegetable Growing	3	
		Electives	3	
D.	**Supporting Course**			3
	(Recommended Electives)			
	5 AE	Engines and Tractors or	3	
	16 AE	Work Simplification or	3	
	P 30	Ornamental Horticulture	3	
	P 31	Landscape Plant Materials	3	
	P 33	Greenhouse Management	4	
	P 35	Landscape Designing	3	
		Total		64

II. Animal Technology Curriculum

This program of study provides technical training and experience for careers in animal production in dairy cattle, poultry, beef cattle, pleasure horses, sheep, swine, and the related sales and service industries. Previous farm experience is considered helpful for enrollees. Graduates frequently return to the home farm or are employed as herdsmen or foremen on other farms. An increasing number of graduates are employed in the integrated broiler or market egg industries or in sales and service in the feed, fertilizer, and machinery industries. Other employment opportunities include soil conservation service, breeding technicians, D.H.I.A. field men, and the Peace Corps.

ANIMAL TECHNOLOGY

			Required Hours
A. Basic Core Curriculum			17
B. Animal & Veterinary Science			23
	1 AnV	Dairy Cattle	3
	2 AnV	Animal Production	3
	3 AnV	Animal Selection	2
	4 AnV	Animal Breeding	3
	5 AnV	Milk Composition and Testing	3
	6 AnV	Animal Feeding	3
	12 AnV	Reproduction and Breeding	3
	5 AnV	Livestock Diseases	3
C. Agriculture Technology			10
	3 ARE	Farm Management	3
	2 P	Soils and Fertilizers	4
	3 P	Forage Management	3
D. Free Electives			14
		Total	64

III. Animal Medical Technology Curriculum

This course of animal study provides technical training and experience for careers as laboratory animal technicians in biological and medical research laboratories, small animal hospitals, commercial testing laboratories for pharmaceutical and feed industries and veterinary aides. The curriculum provides specialized courses in animal care, handling, breeding, feeding, health, anatomy, and physiology, and in laboratory clinical work. Eight weeks of training is required at no additional cost to the student at the Animal Medical Center in New York City during the student's final semester.

			Required Hours
A. Basic Subject Curriculum			12
	13 AE	Mathematics	3
	1 Eh	English Composition	3
	Mhe 50	Man & His Environment	3
	1 Sh	Oral Communication	3
B. Fundamental Sciences			28
	4 AnV	Animal Genetics & Breeding	3
	6 AnV	Animal Feeding	3
	9 AnV	Mammalian Anatomy	4
	10 AnV	Mammalian Physiology	4
	12 AnV	Reproduction & Breeding	3
	19 AnV	Lab Animal Diseases	3
	5 Bc	Biochemistry	4
	2 By	Bacteriology	4

C. Applied Technology			14
14 AnV	Animal Care	3	
16 AnV	Laboratory Animal Techniques	4	
20 AnV	Pathogenic Microbiology	4	
24 AnV	Laboratory Methods	3	
D. Training at the Animal Medical Center New York City			9
30 AnV	Radiology	2	
32 AnV	Surgery and Medicine	3	
34 AnV	Clinical Lab Methods	2	
36 AnV	Gross & Historical Techniques	2	
E. Elective Credits			3
	Total		66

IV. Food Service Management Curriculum

The two-year technical program in Food Service Management is designed to prepare individuals for supervisory or managerial positions in commercial and inplant feeding establishments, school lunch programs, and public and private institutions. The curriculum provides technical courses in food purchasing, quantity food production, food handling and food technology.

			Required Hours
A. Basic Core Curriculum			17
B. Technical Food Service Management			17
1 Fn	Nutrition in Human Development	3	
2 Fn	Principles of Food Preparation	3	
3 Fn	Quantity Food Production	3	
4 Fn	Menu Planning & Analysis	2	
5 Fn	Food Service Equipment	3	
6 Fn	Food & Beverages Purchasing & Control	3	
C. Business and Economics			12
2 ARE	Intro. to Economics	3	
8 ARE	Principles of Accounting	3	
16 AE	Work Simplification	3	
20 ARE	Managing the Business Firm	3	
D. Sociology			3
6 ARE	Dynamics of Human Behavior	3	
E. Food Technology & Handling			8
2 Bc	Food Chemistry	4	
2 By	Food Bacteriology & Sanitation	4	
F. Electives			9
	Total		64

V. Merchandising (Home Furnishings and Clothing) Curriculum

In recent years the rapid technological development of new textiles, new finishing processes for existing textiles, and new materials for home furnishings, has created a need for personnel in the retail field at the supervisory and managerial level who have an understanding of these materials. The curriculum will provide specialized courses in textiles, clothing, home furnishings, commercial and advertising design and fashion merchandising.

				Required Hours
A.	**Basic Core Curriculum**			17
B.	**Technical Home Furnishings and Clothing**			19
	1 Cd	Introduction to Design	3	
	3 Cd	Textiles in Home and Clothing	3	
	4 Cd	Furnishing and Decorating the Home	4	
	6 Cd	Clothing the Family	3	
	7 Cd	Commercial and Advertising Design	3	
	8 Cd	Fashion Merchandising	3	
C.	**Business and Economics**			13
	2 ARE	Introduction to Economics	3	
	4 ARE	Principles of Marketing	4	
	8 ARE	Principles of Accounting	3	
	10 ARE	Sales Promotion	3	
D.	**Sociology**			5
	6 ARE	Dynamics of Human Behavior	3	
	7 ARE	Sociology and the Individual	2	
E.	**Electives**			10
		Total		64

VI. Forest Management Curriculum

Forest industries and federal and state resource agencies indicate a need for increasing numbers of forest technicians over the next few years. Many positions are salaried and are supervisory in nature. Duties may include timber cruising, scaling and marketing, administration of recreation, or assisting in forestry research. Much of the work will be in attractive outdoor surroundings. The curriculum includes eight weeks of summer camp.

		Required Hours
A.	**Basic Core Curriculum**	17
	(Substitute MsT2, Basic Mathematics, for 13 AE, Applied Mathematics)	

B. Technical Forestry			21
2 Fy	Applied Silviculture	4	
3 Fy	Introduction to Forest Technology	1	
4 Fy	Aerial Photo Interpretation	3	
5 Fy	Forest Measurements	4	
6 Fy	Wood Products Utilization	3	
7 Fy	Forest Protection	2	
8 Fy	Seminar	1	
9 Fy	Forest Land Management	3	
C. Supporting Subject Matter			26
2 ARE	Introduction to Economics	3	
6 ARE	Dynamics of Human Behavior	3	
8 ARE	Accounting Principles	3	
1 Bt	Introductory Botany	3	
5 AE	Engines and Tractors	3	
16 AE	Work Simplification	3	
Ge T1	Technical Drawing	2	
Ce T4	Elements of Surveying	3	
1 S	Fundamentals of Forest Soils	3	
D. Other			
1 Pe	Physical Education	0	
2 Pe	Physical Education	0	
	Total		64

Summer Camp
(All students are required to have summer camp experience at the School of Forest Resources' camp near Princeton)

10s Fy	Field Measurements	3
11s Fy	Fire Control Practice	1
12s Fy	Harvesting and Manufacturing	2
13s Fy	Recreation and Wildlife	2
		8

TWO-YEAR TECHNICAL COURSE DESCRIPTIONS

AGRICULTURAL AND RESOURCE ECONOMICS (ARE)

2. Introduction to Economics—A study of economic principles applied to the economy as a whole and to the business firm. Consideration will be given to money and banking, government, finance, credit, and pricing. *Rec* 3, *Cr* 3.

3. Farm Management — Managing the farm business for optimum returns; economic guides to decision making; management tools and their application; organizing resources for production; adjustments to change. *Rec* 3, *Cr* 3.

MR. HARLAN

4. Principles of Marketing—A study of marketing and the basic activities involved in this function of modern business. Covers theoretical principles, consumer and product characteristics, trade practices, market channels, and the improvement of markets and marketing. *Rec* 3, *Cr* 3. MR. WING

6. Dynamics of Human Behavior—An introductory course which explores the applications of social psychology. Five major areas will be covered: social

basis of personality, status-roles, socialization, development of meanings, and the individual and the group. Attention will be given to work situations involving human relationships, leadership, and supervision. *Rec* 3, *Cr* 3. MR. GAMACHE

‡*7. Sociology and the Individual*—Emphasis is placed upon the relationship of the individual to the various social systems of which society is composed. An action approach is taken. The social systems of community, family, religion, education, and economics are especially emphasized. In addition, leadership, power structure, and social stratification are analyzed. *Rec* 2, *Cr* 2. MR. GAMACHE

8. Principles of Accounting—The principles and procedures used in the preparation of balance sheets and income statements. Deals with the systematic recording, classifying, and analyzing of business transactions. Emphasis is on the preparation and presentation of accounting information. *Rec* 2, *Lab* 2, *Cr* 3. MR. WING

10. Sales Promotion—The use of advertising, sales techniques and merchandising in food marketing. Consideration also given to training of sales and service personnel. Case studies are used to develop an interdisciplinary approach to promotion. *Rec* 3, *Cr* 3.

12. Introduction to Statistics—The nature and effective uses of statistics, including the methods of organizing and interpreting data for business management decisions. Topics such as charts, graphs, distribution, sampling variability, indexes and time series will be studied. *Rec* 2, *Lab* 2, *Cr* 3. MR. HARLAN

15. Independent Studies in Business Management—Analysis of and readings on current management problems in food production, processing, distribution, and marketing. Prerequisite: permission of instructor. *Cr* 1. STAFF

20. Managing the Business Firm—Forms of business organization, economic framework, the managerial functions, techniques of financial and credit management, the application of business records in managerial decision making and concepts of managerial economics are presented in light to the needs of a firm. *Rec* 3, *Cr* 3.

22. Electronic Data Processing—The principles and techniques of electronic data processing. Special case studies will be used to give the student training in the practical application of the principles and operation of electronic data processing equipment and the use of the results in business management. Prerequisite: Permission of instructor; preference given to second-year students. *Rec* 3, *Cr* 3.

24. Food Distribution Management—The management approach to food marketing. Study of food distribution channels, including supermarkets, warehouse distribution centers, and other types of outlets. Case studies in management policies, facility layout procedures, merchandising, price policies, sales promotion, and advertising will be used. Firm visits. (Lab fee $5.00) Prerequisite: 4 ARE. *Rec* 2, *Lab* 4, *Cr* 4. MR. KING

28. Interpretation of Financial Records—Emphasis is on the analysis of financial statements for use by management. Stress is placed on financial relationships, the limitations of financial data, and the ways in which financial information can be used. Prerequisite: 8 ARE. *Rec* 2, *Lab* 2, *Cr* 3. MR. WING

AGRICULTURAL ENGINEERING (AE)

5. Engines and Tractors—The construction, principles, and maintenance of spark ignition and diesel engines for farm tractors and related equipment.

Use of repair tools. Choice and use of tractors for optimum field performance. *Rec* 2, *Lab* 2, *Cr* 3. MR. ELLIS

8. Farm Machinery—The principles, operation adjustment, service, selection, and management of farm machinery. Laboratory work includes adjustment, test, and calibration of field machines. *Rec* 2, *Lab* 2, *Cr* 3. MR. GRAY

9. Farm Buildings—Functional planning and economic considerations, materials, methods of construction and environmental control for production, processing and storage buildings. *Rec* 2, *Lab* 2, *Cr* 3. MR. WILLIAMS

10. Electrification—Electrical terms and circuits. Electrical equipment for heat and power. Basic wiring techniques, including planning of wiring systems. *Rec* 2, *Lab* 2, *Cr* 3. MR. SMITH

11. Soil and Water Management—Elementary farm surveying. Application of soil and water structures such as farm ponds. drainage systems, irrigation systems, and soil erosion control systems. *Rec* 2, *Lab* 2, *Cr* 3. KLINGE

12. Utilities—Selection, care and use of water and sewage disposal systems. *Rec* 2, *Lab* 2, *Rec* 3. STAFF

15. Refrigeration Technology—The principles, selection, and operation of refrigeration units and materials handling equipment associated with refrigerated storages and transportation. *Rec* 2, *Lab* 2, *Cr* 3. MR. RHOADS

16. Work Simplification—A study of the principles and methods for accomplishing work. Procedures cover: (1) measuring and improving efficiency of labor, and (2) comparing alternative methods of performing an operation. Problems furnish practice in planning improved work methods and managerial procedures. *Rec* 2, *Lab* 2, *Cr* 3. MR. RHOADS

ANIMAL SCIENCES (AnV)

1. Dairy Cattle—The practical application to herd management of lactation, environment, reproduction, sanitation, housing, and breed association programs. The laboratory is devoted to practical problems in the management of a herd of dairy cattle. Field trip fee $3. *Rec* 2, *Lab* 2, *Cr* 3. MR. LEONARD

2. Animal Production—Breeds and types of beef cattle, sheep, swine and pleasure horses; their care, feed, and management. *Rec* 2, *Lab* 2, *Cr* 3. MR. BRUGMAN

3. Animal Selection—A study of the principles of animal selection. *Rec* 1, *Lab* 2, *Cr* 2. MR. LEONARD

4. Animal Breeding—Animal genetics, systems of breeding and principles of selecting farm and laboratory animals. *Rec* 3, *Cr* 3. MR. DICKEY

5. Milk Composition and Testing—A study of milk constituents and properties. Emphasis on testing milk and milk products for fat and solids; methods of milk processing. *Rec* 2, *Lab* 2, *Cr* 3. MR. HOOVER

6. Animal Feeding—A study of the principles of nutrition, feeds and their values, and the nutritive requirements of animals. The laboratory is devoted to the principles of nutrition and ration formulation; one section for farm animals and one section for laboratory animals. Field trip fee $3. *Rec* 2, *Lab* 2, *Cr* 3. MR. LEONARD, MR. GERRY

7. Poultry Production—A general survey course designed to introduce the students to the many aspects of the poultry industry. Professional personnel serving the industry at the University are featured as guest speakers. *Rec* 3, *Cr* 3. MR. HARRIS

8. Meat and Meat Products—Methods of handling and preparing livestock for market, packing house methods, cutting and curing of meats with special emphasis on retailing of meat and poultry products. Laboratory fee of $5. *Rec* 1, *Lab* 4, *Cr* 3. MR. BRUGMAN, MR. GERRY

9. 10. Mammalian Anatomy and Physiology—A descriptive course covering the structure and function of the various tissues, organs, and systems of common laboratory and domestic animals. Laboratory space limited. Priority given to Animal Medical Technology students. Lecture section may be taken without laboratory. *Rec* 3, *Cr* 3 *or Rec* 3, *Lab* 2, *Cr* 4. MR. HARRIS

12. Reproduction and Breeding—A practical course in breeding of cattle, sheep, hogs, and laboratory animals, with emphasis on the reproductive cycle, handling of semen, and management of the breeding programs. *Rec* 2, *Lab* 2, *Cr* 3. MR. BRUGMAN

14. Laboratory Animal Care—The principles and practices of laboratory animal care in clinics, hospitals, and research laboratories; animal house design, equipment, management, and legal regulations. *Rec* 3, *Cr* 3. MR. BIRD

15. Livestock Diseases—Principles of hygiene and sanitation applied to the prevention and control of the common diseases of dairy cattle. *Rec* 3, *Cr* 3.

16. Laboratory Animal Techniques—Principles and practices of animal handling and restraint. Includes methods of breeding, injecting, preparation for surgery, anesthesiology, and minor surgery. *Rec* 2, *Lab* 2, *Cr* 3.

19. Laboratory Animal Diseases—Principles of disease prevention and control as they apply to common laboratory rodents, carnivores, primates, and birds. *Rec* 3, *Cr* 3.

20. Pathogenic Microbiology—Laboratory techniques and procedures for identification and isolation of pathogenic and parasitic organisms. *Rec* 1, *Lec* 2, *Lab* 2, *Cr* 4. MR. GERSHMAN, MR. O'MEARA

21. 22. Problems in Animal and Poultry Production—*Cr Ar.* STAFF

24. Laboratory Methods—A descriptive and laboratory course studying animal clinical procedures in microscopy, urinalysis, hematological methods, blood analysis, and basic instrumentation. *Rec* 2, *Lab* 2, *Cr* 3. MR. O'MEARA

‡***29. Advanced Poultry Production***—The principles of incubation and embryo development; the housing, management, and business practices of the table egg, hatching egg, and broiler industry. Field trip fee $5. *Rec* 2, *Lab* 2, *Cr* 3.

30. Radiology—The basic fundamentals of radiological techniques. Emphasis is placed on applied aspects of radiology as practiced in modern animal medical hospitals. Taken for one-half semester. *Rec* 1, *Lab* 6, *Cr* 2. MR. SUTER

32. Surgery and Medicine—A course designed to train students in the procedures and techniques involved in practical animal medicine and surgery. Taken for one-half semester. *Rec* 1, *Lab* 10, *Cr* 3. MR. BUTLER, MR. CORDELL MR. DE HOFF, MR. TASHJIAN

34. Clinical Laboratory Methods—A course designed to train students in practical clinical laboratory techniques in use in modern animal medical hospitals. Taken for one-half semester. *Rec* 1, *Lab* 6, *Cr* 2. MR. DAS

36. Gross and Histopathological Techniques—A course designed to train students in the principles and techniques of anatomic pathology and histopathology. Taken for one-half semester. *Rec* 1, *Lab* 6, *Cr* 2. MR. DAS

FOREST MANAGEMENT (Fy)

1. Forestry—Establishment and care of woodlots. Tree identification. Methods of estimating volume of standing timber and measuring forest products. Measurement of forest land. *Rec* 2, *Lab* 3, *Cr* 3. (Not open to forest technicians.)

2. Applied Silviculture—Practices and basic concepts in the regeneration, management and cultural treatments of forest stands in order to produce desired timber crops and recreational and other forest values. Field practice in planting, thinning, weeding and pruning and observation of various harvesting methods. *Lec* 2, *Lab* 4, *Cr* 4.

3. Introduction to Forest Technology—A review of the development of forestry in the United States and a survey of career opportunities with emphasis on the technical level. Suggestions for setting guidelines for education and self-development. *Lec* 2, *Cr* 1.

4. Aerial Photo Interpretation—Use of aerial photographs in connection with forest inventory techniques, locating and mapping forest areas, resources and improvements. *Rec* 2, *Lab* 3, *Cr* 3.

5. Forest Measurements—Methods of estimating the cubic volume of forest trees and stands and the volumes of useful products in logs, bolts and standing trees. Determination of growth rate as a basis for management practices. Sampling procedures. Field practice in measuring logs, trees and plots. *Rec* 2, *Lab* 3, *Cr* 3.

6. Wood Products Utilization—A survey of the major forest products industries to give the student an understanding of how the products of the forest are utilized and marketed. Effect of wood quality requirements on forest management. Inspection trips to local wood-using plants. *Rec* 2, *Lab* 3, *Cr* 3.

7. Forest Protection—Problems involved and practices used in the prevention and control of forest fires, insects, diseases and other causes of loss or damage. *Rec* 2, *Cr* 2.

8. Seminar for Forest Technicians—Discussion of developments affecting technicians, current activities in forestry, and evaluation of training. Subjects chosen by class members. *Rec* 1, *Cr* 1.

9. Forest Land Management—Land titles, surveys, owner's rights and liabilities, trespass and relations with the public. Organization and management of properties for timber production and other uses. Predicting returns from investment. *Rec* 2, *Lab* 3, *Cr* 3.

SUMMER CAMP

Forty-eight hours a week. Credit 8

10s. Field Measurements—Practice in several cruising methods. Locating boundaries and mapping a forest area, field work and office calculations in estimating volume. Preparation of operation report. Three weeks of camp.

11s. Fire Control Practice—Field practice in fire line construction and pumper operation with emphasis on crew organization and supervision. Visits to state district headquarters and lookout tower. Problems of providing adequate fire protection to a large forest area. One week of camp.

12s. Harvesting and Manufacturing—Practice in felling, yarding, bucking and piling and studying operation layout, supervision and safety. Observation

of one or more harvesting systems. Studies at lumber and pulp and paper manufacturing plants. Marking of operating area for cutting. One week of camp.

13s. Recreation and Wildlife—Types of recreation development and examination of specific examples. Preparation of a development plan: wildlife in relation to forest management. Treatment of stands to produce more favorable habitat for wildlife. One week of camp.

HOME ECONOMICS

1 Fn. Nutrition in Human Development—Basic nutrition knowledge interpreted in light of the contribution good nutritional practices can make to the welfare of the individual and the community. *Rec* 3, *Cr* 3. STAFF

2 Fn. Principles of Food Preparation—Influence of kind and proportion of ingredients, methods of manipulation, and cookery on food products. Standards for acceptable products. Experience with a wide variety of foods under varied conditions. *Rec* 1, *Lab* 4, *Cr* 3. STAFF

3 Fn. Quantity Food Production—Recipe standardization, portion and quality control; the sanitary, safe and economical use of food and equipment. Emphasis on principles and practices of food preparation that underlie the service of high quality, nutritious food in quantity. Prerequisite: 1, 2 Fn. *Rec* 1, *Lab* 4, *Cr* 3. MISS YOUNG

4 Fn. Menu Planning and Analysis—Principles of menu planning, types and uses, format, organization and pricing. Prerequisite: 1, 2 Fn. *Rec* 2, *Cr* 2. STAFF

5 Fn. Food Service Equipment: Layout and Design—The use, care, maintenance, and selection of small wares and heavy duty equipment. Study of general and itemized specifications; bid analysis and awarding of contracts. Consideration of sanitary codes that affect layouts; blueprint analysis through studies of schematic drawings of equipment, departmental and overall food service layouts. *Rec* 2, *Lab* 2, *Cr* 3. STAFF

6 Fn. Food and Beverage Purchasing and Control—A discussion of sources, grades, methods of purchase, care, and storage of foods; principles of food control, cost analysis and inventory procedures. *Rec* 3, *Cr* 3. STAFF

1 Cd. Introduction to Design—Study of line form, light, color, and texture in merchandise for home furnishings and clothing to obtain beauty, expressiveness, and functionalism in daily living. *Rec* 2, *Lab* 2, *Cr* 3. MR. WATTS

3 Cd. Textiles in Home and Clothing—Learning to recognize quality features of fabrics and to understand labels for fiber content, functional finish, and care. Fiber properties and performance data. Fair claim policy. Names and consumer uses of fabrics. *Rec* 3, *Cr* 3. STAFF

4 Cd. Furnishing and Decorating the Home—Planning functional and aesthetic qualities of the home for individual and family situations. Focus on organization, selectivity, and quality features of merchandise. Overall plan, setting, furniture. Wall and window treatments, lighting, table appointments, and accessories. Prerequisite: 1 Cd. *Rec* 2, *Lab* 4, *Cr* 4. STAFF

6 Cd. Clothing the Family—Clothing and accessories for physical, social, and economic needs of various age groups. Size, cut, fit, construction, and price level. Hanger appeal and combining value in the wardrobe. Studies of consumers' satisfaction. *Rec* 3, *Cr* 3. STAFF

7 Cd. Commercial and Advertising Design—Problems in display and visual communication emphasizing design, lighting, space, materials and color for two- and three-dimensional areas such as show cases in merchandising, two-dimensional advertising, educational displays and basic packaging design. *Rec* 1, *Lab* 2, *Cr* 3.

8 Cd. Fashion Merchandising—Sources of fashion with charting of trends. Promotion of fashion in home furnishings and clothing. Comparative shopping and evaluation of perishability. Prerequisite: 1-7 Cd. *Rec* 3, *Cr* 3. STAFF

PLANT AND SOIL SCIENCES

1 P. Potato Production—Production of potatoes for seed, tablestock and processing. *Rec* 2, *Lab* 2, *Cr* 3. MR. MURPHY

3 P. Forage Management—Production of hay, silage, and pasture crops. Selection of seeding mixtures, establishment of forage seedings; use of lime and fertilizers to maintain forage productivity. Pasture management; harvesting and preservation of hay and silage. *Rec* 2, *Lab* 2, *Cr* 3. MR. BROWN

†***4 P. Fruit Production***—A cultural study of tree fruits and small fruits including apples, blueberries, raspberries and strawberries: also methods of harvest, post harvest handling, marketing, and utilization. *Rec* 2, *Lab* 2, *Cr* 3. MR. ABDALLA

‡***5 P. Vegetable Growing***—Cultural practices for the major vegetable crops of both the home garden and the market garden. *Rec* 2, *Lab* 2, *Cr* 3. MR. ERHARDT

7 P. Home Grounds Improvement—Planning and planting the home grounds to make the home an interesting place in which to work and live. *Rec* 2, *Lab* 2, *Cr* 3. MR. CLAPP

†***8 P. Turf Management***—Care of lawns, golf courses, and other turfed areas. Seeding, fertilizing, mowing, weeding, and insect and disease control. *Rec* 2, *Cr* 2. MR. HOLYOKE

9 P. Post Harvest Physiology of Fruits and Vegetables—A study of storage conditions and their effects on the physiological processes that occur in storage. *Rec* 2, *Lab* 2, *Cr* 3.

10 P. Storage and Handling of Potatoes—A study of the principles of potato storage and post harvest handling of potatoes into and out of storage areas and to market. *Rec* 3, *Cr* 3. MR. MURPHY

1 S. Fundamentals of Forest Soils—Study of the properties of forest soils with interpretations of these properties in terms of tree growth. *Rec* 2, *Lab* 2, *Cr* 3. MR. STRUCHTEMEYER

2 S. Soils and Fertilizers—Soil properties and their relation to crop production, with special emphasis on management and use of commercial fertilizers. *Rec* 3, *Lab* 2, *Cr* 4. MR. MURPHY

SERVICE COURSES IN THE COLLEGE OF LIFE SCIENCES AND AGRICULTURE

1 LSA. University Life—Understanding the University; adjusting to an academic environment; providing guidelines for accepting responsibilites in business and social situations. Pass or fail—no credit.

MR. PULLEN AND MRS. HUTCHINSON

7 LSA. Remedial Mathematics—Basic mathematical operations and alegbra. Solutions of problems associated with business and production. No credit.

13 LSA. Applied Mathematics—Use of graphical and statistical methods, slide rules and other mechanical aids, solution of problems in business, mechanics, agricultural production, and institutional management. *Cr* 3. STAFF

15 LSA. Placement Training—Provides "on-the-job" training in field related to program of study. Work is to be under supervision of employer and appropriate department or school in the College of Life Sciences and Agriculture. *Cr* 4. STAFF

1 Bt. Introductory Botany—The structure and life processes of seed plants, their propagation, breeding, classification, and relation to their environment. *Rec* 2, *Lab* 3, *Cr* 3. MR. HYLAND

2 By. Food Bacteriology and Sanitation—Basic principles of food microbiology together with illustrations of these principles to serve as an aid to workers in the fields related to food industries. *Rec* 2, *Lab* 2, *Cr* 3. MR. WHITEHILL

2 Bc. Food Chemistry—Chemical composition and reactions of materials encountered in the processing and preservation of foods. *Rec* 3, *Lab* 2, *Cr* 4. MR. RADKE

5 Bc. Animal Biochemistry—An introduction to the principles of inorganic, organic, and biochemistry. *Rec* 3, *Lab* 2, *Cr* 4. MISS SMITH

1 En. Applied Entomology—Consideration of insect benefits and detriments to man. General structure, classification, habits, and life histories of representative pest species. Study of all phases of control with emphasis on development, use, and implication of pesticides to production and marketing. *Rec* 2, *Lab* 2, *Cr* 3. MR. BOULANGER

SERVICE COURSES IN THE COLLEGE OF ARTS AND SCIENCES

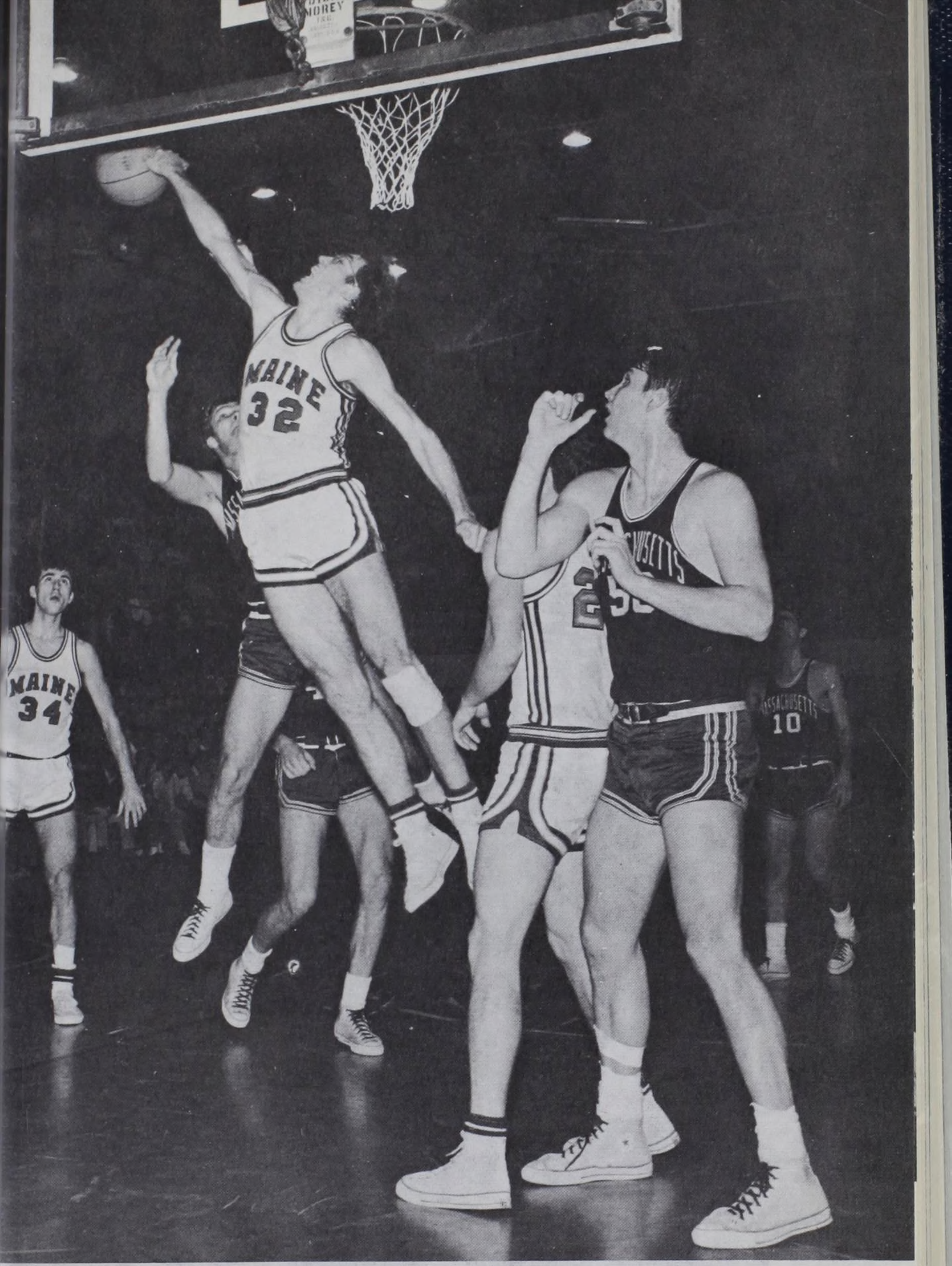
1 Eh. English Compostion—A review of grammar and the principles of effective expression for the purpose of direct application in written reports of practical value. *Rec* 3, *Cr* 3. MR. HOBBS

2 Eh. English Composition—A continuation of 1 Eh with particular emphasis given to expository writing. *Rec* 3, *Cr* 3. MR. HOBBS

2 Pol. State and Local Government—Selected topics on the structure and operation of state, county, and town government, with emphasis on Maine problems of particular interest and significance to Maine agriculture. *Rec* 3, *Cr* 3. MR. HELMKE

3 Pol. Current World Affairs—A survey of current national and international affairs with particular attention to American foreign policies. *Rec* 2, *Cr* 2. MR. HELMKE

1 Sh. Oral Communication—Principles of effective oral communication. Emphasis on selection of subject, organization of material and effective preparation. Experience in the preparation and delivery of short extemporaneous speeches. *Rec* 3, *Cr* 3. MR. COOK


MOREY
MAINE
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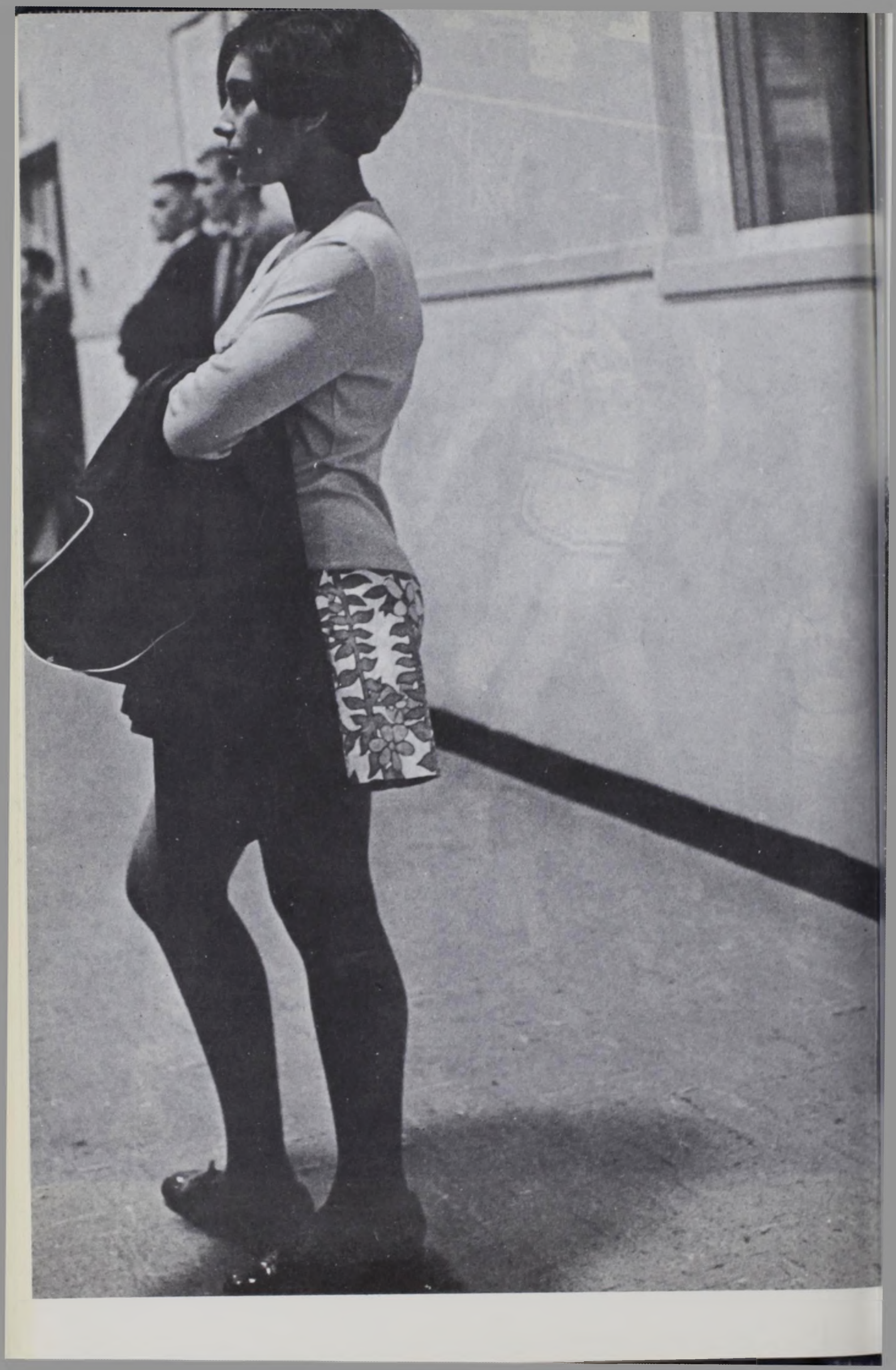

COLLEGE OF TECHNOLOGY

ELDRED W. HOUGH, DEAN

College of Technology

The College of Technology, which recommends the degree of bachelor of science upon completion of any of its curricula, provides instruction in the following:

Agricultural Engineering (Jointly with College of Life Sciences and Agriculture)
Chemical Engineering
Chemistry
Civil Engineering
Electrical Engineering
Engineering Physics
Mechanical Engineering
Pulp and Paper Technology

By special arrangement, a five-year Pulp and Paper Program is available in conjunction with any of the above curricula or the Forestry curriculum.

For information on the two-year programs in Engineering Technology see page 321.

The freshman year is common to all engineering curricula and chemistry.

Freshman Year

FALL SEMESTER					SPRING SEMESTER				
Subject			Hours		Subject			Hours	
Ch	13	Chemical Princ.	3	3 4	Ch	14	Chemical Princ.	3	3 4
Ge	1	Intro. to Design	0	4 2	Eh	1	Freshman Comp.	3	0 3
Ms	12	Anal. Geom. & Cal.	4	0 4	Ge	2	Intro. to Design	0	4 2
Pe	1	Physical Education	0	2 0	Ms	27	Calculus	4	0 4
Ps	1	General Physics	3	3 4	Pe	2	Physical Education	0	2 0
Ge	5	Orientation	1	0 0	Ps	2	General Physics	3	3 4
					Ge	6	Orientation	1	0 0

For information on advanced placement, see page 42.

GRADUATION REQUIREMENTS

(Common to all curricula in the College of Technology beginning with the Class of 1971)

I. An accumulative average of 1.80.
II. Passing grades in all courses required by college and major department.

1. For department requirement see subsequent sections.
2. College requirements.
   a. Common freshman year shown on page 290 or equivalent.
   b. Ms 28 and 29, or equivalent, (Ms 29 is not required of Chemistry majors).
   c. Non-technical courses: Eighteen credit hours are required. In general these courses will be:
      1) distributed between the Social Sciences and Humanities, but
      2) tailored to student's interests if recommended by adviser.
      [The Engineering Physics curricula does not follow the above guideline—see page 313].
      The Social Sciences include courses listed in the catalog under Business, Economics, Modern Society, Psychology, Sociology and Anthropology. Courses in Accounting, Industry Management, Finance and Personnel Administration are excluded.
      The Humanities include courses listed in the catalog under Art, English, Foreign Languages and Classics, History, Political Science, Music and Philosophy. Courses of a cultural and non-technical nature offered in the Speech Department, namely, American Public Address, Theatre History and Theatre Today, and a maximum of three additional credits in Theatre will be accepted. No more than three credits will be accepted in applied music (band, chorus, instrumental or voice music lessons).
      Courses in Scientific German (Gm 13 and 14) and English Composition are excluded.

III. Degree credit for ROTC is not allowed.

Course Expenses

For College of Technology students the minimum and maximum course expenses (inclusive of required equipment, books, and supplies, but exclusive of Military deposit) are indicated in the following table:

Freshmen	$150 per-year, of which approximately $100 will be required the first semester
Sophomores	$100—140 per year
Juniors	$100—160 per year
Seniors	$100—160 per year

In chemistry and chemical engineering courses, students may be required to pay for apparatus broken or lost and for certain non-returnable supplies.

Graduate Study

Graduates from accredited undergraduate programs are eligible for graduate study in the College of Technology, provided their undergraduate records meet general requirements. (See general requirements in the catalog section on Graduate Study.) Candidates must complete, without credit, any undergraduate courses which may be prerequisite to courses included in the program of graduate study. In the master's degree program, in general, from 6 to 10 credit hours will be devoted to a thesis in the field of major interest. Selection of courses must conform to a general plan laid down either before study begins or very soon after registration.

A cooperative five-year program with the Portsmouth Naval Shipyard is available to students enrolled in the baccalaureate degree program. For one year during the program students are registered as full-time at the University while pursuing the shipyard portion at Portsmouth. Financial assistance is provided. Details are available in the office of the Dean of Technology.

Honors Program

Honors courses listed on page 114 are available to students in the College of Technology. The University Honors Program is described on page 35. The successful completion of Hr 41 or Hr 45 will exempt a student from Eh 1. Hr 41, Hr 45 (if not used to replace Eh 1), Hr 47, and Hr 48 may be applied to the non-technical elective requirement. Subsequent honors work will replace portions of the standard curriculum as specified by the student's department head. The area of honors work will be shown on the student's transcript.

DEPARTMENTS OF INSTRUCTION

Courses numbered 1 to 99 are undergraduate courses. They are open to graduate students but credit earned in these courses may not be used to satisfy advanced degree requirements. Courses numbered 100 to 199 are upperclass undergraduate courses which may be used for graduate degree credit by graduate students if given prior approval by the graduate students' advisory committee. Courses numbered 200 to 299 are graduate courses which may be elected by undergraduate honor students, or those undergraduates whose advancement in the field will permit their taking a graduate level course among graduate students without disadvantage to themselves. Courses numbered 300 to 399 are graduate level courses which may be taken only by students admitted to the Graduate School.

One number is used for a course which is given both fall and spring.

When a slant is used between the two numbers (e.g., 1/2), the first semester may be taken by itself, but the second cannot be taken unless the first is taken previously; when a period is used (e.g., 1.2), either semester may be taken for credit; when a dash is used (e.g., 1-2), both semesters must be taken to obtain credit.

AGRICULTURAL ENGINEERING

PROFESSORS SMITH, KLINGE, RHOADS; ASSOCIATE PROFESSORS HUFF, ROWE, SOULE, WILLIAMS

The Agricultural Engineering curriculum combines study in the biological sciences and the physical sciences with mathematics and engineering to provide a unique background for solving engineering problems associated with agriculture.

The basic curriculum is strengthened by elective options which permit the student to specialize in one of four areas according to his interests and needs. Areas of specialization are: (1) Design and application of machinery and power units for the agricultural industry; (2) Design and application of food

and fiber processing systems; (3) Design of agricultural structures; and (4) Soil and water conservation engineering. Electives in engineering and the life sciences aid in providing a broad base of knowledge for engineering practice.

With the rapidly expanding world population, a rising demand for higher standards of living and with limited natural resources, agricultural engineering graduates are in great demand. Employment opportunities are as diverse as the agricultural industry itself. Graduates in Agricultural Engineering may be employed as design engineers by machinery and farmstead systems manufacturers; as sales engineers by machinery, food or chemical companies; as research engineers by industry, government or state experiment stations or in teaching or extension positions by universities. Some practice as consulting engineers. An increasing number of opportunities for foreign service are opening up.

The curriculum in Agricultural Engineering is a joint responsibility of the College of Technology and the College of Life Sciences and Agriculture.

Graduate Work in Agricultural Engineering

The degree of master of science (Agricultural Engineering) and master of engineering (Agricultural Engineering) is offered with options for specialization in soil and water engineering, farm structures, agricultural power and machinery, and electric power and processing.

Several research assistantships are available each year. Incumbents devote half time to research work on approved projects of the Agricultural Experiment Station.

AGRICULTURAL ENGINEERING CURRICULUM

Freshman Year. See Page 290

Sophomore Year

FALL SEMESTER							SPRING SEMESTER						
Subject			Hours				Subject			Hours			
			R	L	C					R	L	C	
AE	55	Materials in Ag. Eng.	2	2	3	AE	82	Intro. to A.E.	1	2	2		
Ge	7	Computer Programming	1	2	2	Me	51	Strength of Matls.	4	0	4		
Me	53	Applied Mechanics I	4	0	4	Me	54	Applied Mech. II	4	0	4		
Ms	28	Anal. Geom. & Calculus	4	0	4	Ms	29	Calculus & Diff. Eq.	4	0	4		
		Humanities Elective			3			Humanities Elective			2		
					16						16		

Junior Year

AE	169	Agr. Processing	2	3	3	AE	163	Farm Structures	2	3	3	
Me	33	Thermodynamics	3	0	3	AE	167	Ag. Power	2	3	3	
		*Ag. & Bio. Sci. Elec.			3	Ee	41	Elem. Circuits	3	0	3	
		**Technical Elective			3	Me	59	Fluid Mechanics			3	
		Humanities Elective			4			Humanities Elective			3	
								Ag. & Bio. Sci. Elec.			3	
					16						18	

Senior Year

AE	160	Agr. Machinery	2	3	3	AE	84	Special Topics in A.E.	3
AE	165	Soil & Water Eng.	3	3	4			Ag. & Bio. Sci. Elec.	6
AE	80	Seminar	1	0	0			Technical Elective	3
AE	83	Special Prob. in A.E.			1			Humanities Elective	3
		Humanities Elective			3				
		Tech. Elective			3				
		Ag. & Bio. Sci. Elective			3				
					17				15

* 15 hours of elective credit as approved by the student's adviser must be in Biological or Agricultural Science. S2, Soils and Bt1, General Botony or Zo3, Animal Biology must be included.

** 9 hours of technical elective credit must consist of a coherent group of engineering courses approved by the student's adviser.

Students transferring to the University of Maine under the Regional Program from the Universities of Massachusetts, New Hampshire, Rhode Island, or Vermont should check the bulletins for those institutions for the first two years in Agricultural Engineering.

*** Ce 26 Hydraulics may be substituted.

For course descriptions in Agricultural Engineering, see page 231.

CHEMICAL ENGINEERING
(Including Pulp and Paper Technology)

PROFESSORS BOBALEK, CHASE, DURST, ZABEL, ZIEMINSKI; ASSOCIATE PROFESSORS CECKLER, ELTON, GORHAM, SIMARD, THOMPSON; LECTURERS MARSHALL AND MUMMÉ; INSTRUCTORS COSKUNER, ERSKINE.

The Chemical Engineering curriculum aims to provide the education necessary for professional work in the design, operation and improvement of the processes of chemical industry. The curriculum provides a broad background in the humanities and in the fundamentals of science and engineering, and affords the opportunity for the application of these fundamentals in professional courses.

Since it is essential that chemical engineers have a sound understanding in basic chemistry, the curriculum in the sophomore and junior years includes the fundamental courses in the Chemistry curriculum. So the student may gain an early understanding of the significance of his major field, professional Chemical Engineering courses are introduced in the sophomore year and are continued through three years in logical sequence. Necessary basic knowledge of electrical and mechanical engineering is provided by courses in the appropriate departments. Also, the faculty counselor will assist in defining a program of elective courses which allows each student to develop special interests where chemical engineering science is important. The curriculum leads to the degree of bachelor of science in chemical engineering.

An important activity of this department is the Division of Pulp and Paper Technology. Students who are interested in the pulp and paper industry or allied fields may elect to take a senior year curriculum largely composed of specialized professional subjects in the pulp and paper field, the other years being identical with the general Chemical Engineering curriculum. This curriculum leads to the bachelor of science degree in pulp and paper technology. It is possible for certain students, who do not desire a B.S. degree, to register as special students for a series of related Pulp and Paper and Chemical Engineering courses.

A five-year pulp and paper program with emphasis on courses in management of technical enterprises is available. This curriculum contains the required courses of the four-year curricula in Chemical or in some other field of science or engineering and Pulp and Paper Technology. It also includes selected courses in economics and business administration or in systems analysis and process control. It leads to the degree of bachelor of science and a certificate indicative of the curriculum in pulp and paper management.

Graduate Work in Chemical Engineering

Candidates for the degree of master of science in chemical engineering must have received the degree of bachelor of science. They must also have completed a curriculum consistent with the requirements of the American Institute of Chemical Engineers, or take the necessary courses to accomplish that objective without receiving graduate credit for them. Graduate credit for the advanced degree generally consists of a minimum of 20 hours of graduate level courses and 10 hours of thesis. Some industrial fellowships and assistantships are available to graduate students. A candidate who accepts either of these usually requires two years to complete the requirements for the master of science degree in chemical engineering.

Graduate work leading to the master of science degree is also offered in the Pulp and Paper Division. Candidates who complete, concurrently, in a five-year program, requirements for both the B.S. degree and certificate in Pulp and Paper may receive graduate credit for 20 hours of suitable courses taken in the fifth year, provided that they have been admitted tentatively to Graduate School before beginning their fifth year. Admission to Graduate School is required only of those students in the Certificate Program who wish to obtain graduate program degree hour credit for a part of the study which overlaps requirements for the certificate, and which is not included as a requirement for the B.S. degree.

Graduate programs are also available that lead to the doctor of philosophy degree in chemical engineering.

CURRICULUM IN CHEMICAL ENGINEERING

Freshman Year. See Page 290

Sophomore Year

FALL SEMESTER						SPRING SEMESTER					
Subject			Hours			Subject			Hours		
			Rec.	Lab.	Cr.				Rec.	Lab.	Cr.
ChE	1	Fund. of Chem. Eng.	2	4	4	ChE	2	Fund. of Chem. Eng.	2	4	4
Ch	151	Organic Chemistry	3	0	3	Ch	152	Organic Chemistry	3	0	3
Ms	28	Calculus	4	0	4	Ch	41	Quantitative Analysis	2	3	3
		*Electives (3-6 hrs.)				Ms	29	Differential Equations	4	0	4
								*Electives (0-3 hrs.)			
		Total	14-17					Total	14-17		

Junior Year

FALL SEMESTER						SPRING SEMESTER					
Subject			Hours			Subject			Hours		
			Rec.	Lab.	Cr.				Rec.	Lab.	Cr.
ChE	160	Elements of Chem. Eng.	4	0	4	ChE	162	Elements of Chem. Eng.	4	0	4
ChE	168	Chem. Eng. of Kinetics	3	0	3	ChE	195	Chem. Eng. Thermo	4	0	4
Ch	171	Physical Chem.	3	5	5	Ch	172	Physical Chemistry	3	5	5
		*Electives (3-6 hrs.)						*Electives (3-6 hrs.)			
		Total	15-18					Total	16-19		

Senior Year

FALL SEMESTER						SPRING SEMESTER					
Subject			Hours			Subject			Hours		
			Rec.	Lab.	Cr.				Rec.	Lab.	Cr.
Che	196	Process Control	3	0	3	Ee	41	Electric Circuits	3	0	3
Che	177	Chem. Processes	3	0	3	ChE	163	Chem. Eng. Lab.	0	4	2
Che	161	Chem. Eng. Lab.	0	4	2			*Electives (9-12 hrs.)			
Me	55	Statics and Strength of Materials	3	0	3						
		*Electives (3-6 hrs.)									
		Total	14-17					Total	14-17		

* Electives

In addition to the courses which are a common requirement for all candidates for the degree of bachelor of science in Chemical Engineering, each student must complete a program of at least 30 credit hours of elective courses which will be determined by each student, subject to the advice and the approval of his faculty adviser. At least 18 credit hours of each student's elective program must consist of an approved program in fields of study such as modern languages, philosophy, economics, or other areas of the social sciences or the humanities. The program of non-technical courses aims to acquaint the student in some depth with the structure and application of other intellectual disciplines outside of science and technology which are important to communication or participation in human affairs.

At least 12 credit hours of the elective program must be made up of courses in engineering, or in basic sciences, (chemistry, physics, the life sciences, or mathematics). Each student's program of technical electives should aim to develop some identifiable special interest which expands his understanding either of some scientific foundations or of some special applications of chemical engineering science.

Curriculum in Pulp and Paper Technology

Sophomore and Junior years. Identical with Chemical Engineering with the exception of Ch 171 and Ch 172, which are recommended electives. This program satisfies the requirements for the degree of bachelor of science in Pulp and Paper Technology.

Senior Year

FALL SEMESTER						SPRING SEMESTER					
Subject			Hours			Subject			Hours		
			Rec.	Lab.	Cr.				Rec.	Lab.	Cr.
Me	55	Statics and Strength of Materials	3	0	3	Ee	41	Electric Circuits	3	0	3
						Pa	166	Paper Technology	3	0	3
Pa	165	Pulp Technology	3	0	3	Pa	174	Paper Mfg. & Testing	0	8	4
Pa	173	Pulp Mfg. & Testing	0	8	4	Pa	199	Thesis	0	4	2
Pa	189	Pulp & Paper Mill Insp.	0	4	2			Technical Elective			3
Pa	199	Thesis	0	2	1						
Pa	172	Pulp & Paper Mill Equip.	3	0	3						
		Total	16					Total	15		

Five-Year Curriculum in Pulp and Paper Technology

In the fourth and fifth years a minimum of 30 credit hours beyond the B.S. degree are required. The required courses are: Pa 165 (or Pa 172), Pa 166, Pa 173, Pa 174, Pa 199 (or Pa 295). A variety of course programs can be developed by the student with consultation and approval of his adviser. Two sample programs are given below as illustrations of curricula which complete, by the end of the fifth year, the requirements for a B.S. degree and a certificate for advanced study in Pulp and Paper Technology.

Curriculum Sample I

Sophomore and Junior Years: Identical with Chemical Engineering

Fourth Year

FALL SEMESTER			Hours			SPRING SEMESTER			Hours		
	Subject		Rec.	Lab.	Cr.		**Subject**		Rec.	Lab.	Cr.
*ChE	177	Chem Processes	3	0	3	*ChE	163	Chem. Eng. Lab.	0	4	2
*ChE	196	Process Control	3	0	3	*Pa	166	Paper Technology	3	0	3
*Pa	165	Pulp Technology	3	0	3	*Ec	41	Electric Circuits	3	0	3
*ChE	161	Chem. Eng. Lab.	0	4	2	ChE	151	Digital Computer	2	2	3
ChE	150	Analog Computer Pro.	2	2	3			Elective (3 or 6 Cr. hrs.)			
		Electives			3						
		Total			17			Total			14-17

Alternative Curriculum Sample II

Sophomore and Junior Years: Identical with Mechanical Engineering

Fourth Year

FALL SEMESTER			Hours			SPRING SEMESTER			Hours		
	Subject		Rec.	Lab.	Cr.		**Subject**		Rec.	Lab.	Cr.
*Me	24	Mechanical Design I	2	3	3	*Pa	166	Paper Technology	3	0	3
Pa	172	Pulp and Paper Equipment	3	0	3	*Me	72	Mechanical Lab.	0	3	2
*Me	71	Mech Lab.	0	3	2	*Me	186	Power Plants	3	0	3
Ba	9	Prin. of Accounting	3	0	3	Ba	130	The Legal Env. of Busn.	3	0	3
		Me Technical Elective			3			Me Elective			3
		Humanity-Social Science			3						
		Total			17			Total			14

Curriculum Sample I

Fifth Year

(For Chemical Engineering)

FALL SEMESTER			Hours			SPRING SEMESTER			Hours		
	Subject		Rec.	Lab.	Cr.		**Subject**		Rec.	Lab.	Cr.
*Me	55	Statics & Strength of Materials	3	0	3	*Pa	174	Paper Mfg. & Testing	0	8	4
*Pa	173	Pulp Mfg. & Testing	0	8	4	*Pa	296	Graduate Seminar	1	0	1
*Pa	295	Graduate Seminar	1	0	0	*Thesis			0	4	2
*Pa	199	Thesis	0	2	1			Electives			9
		Electives			3-6						
		Total			14-17			Total			16

* Required Courses

UNIVERSITY OF MAINE

Curriculum Sample II

Fifth Year

(For Mechanical Engineering)

FALL SEMESTER						SPRING SEMESTER					
		Subject	Hours					Subject	Hours		
			Rec.	Lab.	Cr.				Rec.	Lab.	Cr.
*Pa	173	Pulp Mfg. & Testing	0	8	4	*Pa	174	Paper Mfg. & Testing	0	8	4
Pa	199	Thesis	0	2	1	Pa	199	Thesis	0	4	2
Pa	295	Seminar	1	0	0	Pa	296	Seminar	1	0	1
*Me	160	Heat Transfer	3	0	3	*Ee	42	Electrical Machinery	3	0	3
Ba	151	Business Finance	3	0	3			Me Elective			3
		Elective			3-6			Free Elective			3
					Total 14-17						Total 16

* Required Courses

Courses in Chemical Engineering

(In each laboratory course a breakage card is required.)

1/2. Fundamentals of Chemical Engineering—The application of the principles of material and energy balances to the solution of problems in chemical engineering operations and processes through quantitative correlation of basic concepts of chemistry, physics, and mathematics. Laboratory work includes the use of basic chemical engineering equipment and analytical devices, and the fundamentals of report writing. Prerequisite: Ch 2, *Rec* 2, *Lab* 4, *Cr* 4.

MR. CECKLER, MR. GORHAM, MR. THOMPSON

150. Analog Computer Programming—Fundamentals of linear and non-linear analog computer programming. Solutions of ordinary and partial linear and non-linear equations. Simulation of physical systems representing various engineering and scientific disciplines. Simulation of process control systems. Prerequisite: Ms 29 (or concurrent registration) or permission of the instructor. *Rec* 2, *Lab* 2, *Cr* 3. MR. MUMMÉ

151. Digital Computation—Fundamentals of machine language. Symbolic Programming Systems. Emphasis on student use of equipment via laboratory exercises. Examples and applications in engineering and science. Prerequisites: None (Gc 7 is recommended, but not required). *Rec* 2, *Lab* 2, *Cr* 3. MR. MUMMÉ

160/162. Elements of Chemical Engineering—Introduction to rate operations, stage operations, and the principles of molecular and turbulent transport of mass, momentum, and energy. Application of these principles to the chemical engineering unit operations. Prerequisites: Ms 29; ChE 2. *Rec* 4, *Cr* 4. MR. CHASE

161/163. Chemical Engineering Laboratory—Application of the principles of the unit operations in the laboratory, using pilot scale equipment. Emphasis is placed upon the preparation of formal reports. Prerequisite. ChE 160 for 161; ChE 162 for 163. *Lab* 4, *Cr* 2. MR. DURST

168. Chemical Engineering Kinetics—Kinetics of homogeneous reactions and solid catalytic reactions. Heat and mass transfer in, and design of, reactors. Prerequisite: ChE 162. *Rec* 3, *Cr* 3. MR. ELTON

177/178. Chemical Process Industries and Elements of Chemical Plant Design—Representative industrial chemical processes. Quantitative and qualitative evaluations of the processes and proposed changes and improvements are stressed. Particular emphasis is given to practice in coordination of engineering data and theory in selective decisions in plant design. *Rec* 3, *Cr* 3. MR. ZIEMINSKI

195. Chemical Engineering Thermodynamics—Application for thermodynamics to the analysis of systems of interest to chemical engineers. Topics include the first and second laws of thermodynamics, thermodynamic properties, chemical equilibrium, and an introduction to statistical and irreversible thermodynamics. Prerequisites: ChE 2; ChE 160. *Rec* 4, *Cr* 4. MR. THOMPSON

196. Process Control—Process dynamics described by ordinary differential equations and by linearized approximations. Solution of system equations by use of Laplace transforms. Concepts of feedback control and close-loop system analysis. Prerequisite: ChE 162. *Rec* 3, *Cr* 3. MR. GORHAM

199. Undergraduate Thesis—Original investigation of a chemical engineering problem, and reporting of the results. *Cr Ar.*; Accumulative credit hours for 2 or more semesters is 3-6. STAFF

Graduate Courses

220. Colloid Technology—*Rec* 3, *Cr* 3.

221. Fuel and Combustion—*Rec* 3, *Cr* 3.

222. Chemical Engineering Plant Design—*Rec* 3, *Cr* 3.

223. Economic Balance—*Rec* 3, *Cr* 3.

230. Introduction to Polymer Science—*Rec* 3, *Cr* 3.

242. Process Dynamics and Control—*Rec* 3, *Cr* 3.

252-253. Special Problems in Computer Programming and Systems Analysis.

270. Chemical Engineering of Pulp and Paper Manufacturing—*Rec* 3, *Cr* 3.

287. Chemical Engineering Practice. Time and credit to be arranged.

330. Advanced Chemical Engineering Thermodynamics—*Rec* 3, *Cr* 3.

331. Kinetics and Catalysis—Rec 3, Cr 3.

351. Transport Phenomena—Momentum—*Rec* 3, *Cr* 3.

352. Transport Phenomena—Mass and Energy—*Rec* 4, *Cr* 4.

360-365. Advanced Unit Operations—*Rec* 3, *Cr* 3.

395. Graduate Seminar—*Rec* 1, *Cr* 0.

396. Graduate Seminar—Pre. ChE 295. *Rec* 1, *Cr* 1.

399. Graduate Thesis—*Cr Ar.*

Courses in Pulp and Paper Technology

40s. Summer Mill Practice—Summer internship in engineering practice in an industrial plant of the pulp and paper or allied industries. *Cr* 2. STAFF

165. Pulp Technology—A course in the manufacture of various kinds of wood pulps and the chemistry of present-day pulp making. Prerequisite: Ch 152. *Rec* 3, *Cr* 3. MR. SIMARD, MR. ZABEL

166. Paper Technology — A course in paper manufacturing processes. *Rec* 3, *Cr* 3. MR. SIMARD, MR. ZABEL

172. Pulp and Paper Equipment—A lecture and recitation course involving the description, and production calculations, of pulping, stock preparation, stock flow, paper formation, power plant, and auxiliary equipment. Prerequisite: Pa 166 (may be taken concurrently). *Rec* 3, *Cr* 3. MR. ZABEL, MR. GORHAM

173. Pulp Manufacture and Testing—A laboratory course involving the production and testing of chemical and semi-chemical wood pulps. Prerequisite: Ch 41, Pa 165 or Pa 172 (may be taken concurrently). *Lab* 8, *Cr* 4. MR. SIMARD, MR. ZABEL

174. Paper Manufacture and Testing—A laboratory course in the manufacture of paper, including beating, jordaning, sizing, etc., and physical, chemical, and microscopic testing. Prerequisite: Ch 41, Pa 166 (may be taken concurrently). *Lab* 8, *Cr* 4. MR. SIMARD, MR. ZABEL

189. Pulp and Paper Mill Inspection—A study of the operations in various types of pulp and paper plants. *Lab* 4, *Cr* 2. This course requires a laboratory fee of $30. MR. SIMARD

199. Undergraduate Thesis—Original investigation of a pulp and paper problem and reporting of the results. Open only to seniors. *Cr Ar.*

Graduate Courses

284. Decision Techniques in Management Engineering Projects—*Rec* 3, *Cr* 3.

295. Graduate Seminar—*Rec* 1, *Cr* ½.

296. Graduate Seminar—Prerequisite Pa 295. *Rec* 1, *Cr* 1.

399. Graduate Thesis—*Cr Ar.*

CHEMISTRY

PROFESSORS WOLFHAGEN, BEAMESDERFER, DOUGLASS, DUNLAP; ASSOCIATE PROFESSORS GEORGITIS, GOODFRIEND, GREEN; ASSISTANT PROFESSORS BENTLEY, PATIN, PATTERSON, RASAIAH, RUSS; RESEARCH ASSOCIATE HILL; MRS. WHITNEY, MRS. WOLFHAGEN

The Chemistry curriculum is designed to give the student a thorough understanding of the fundamental nature of material substances, the changes they undergo and the laws governing such changes. It also aims to develop skill in those laboratory techniques required to synthesize and to analyze substances and to study their properties.

Because a knowledge of chemistry is fundamental to successful work in so many fields, the Chemistry curriculum affords an unusual opportunity for a wide choice of electives so that the chemistry major may adapt his program to his individual interests and future needs. The curriculum leading to American Chemical Society certification prepares the student, upon graduation, for employment in the chemical industry in the fields of production and control, development, or research. Maine graduates in chemistry who attain better than average levels of proficiency are exceptionally well qualified for graduate study in chemistry.

The proper choice of electives will enable the student to enter related fields of industrial management, technical sales and service, and teaching, or may qualify him for medical school or graduate work in one of the newer interdisciplinary fields such as oceanography. Students interested in these fields, or who have

special interests in the biological sciences, geology, mathematics, nuclear science, or physics, may obtain from the department specimen curricula showing recommended elective sequences which will help them attain their goals. Up to 21 semester hours of free electives may be taken while remaining within a normal five course per semester load. Better students may elect additional courses.

The chemistry major, in order to qualify for a degree in the College of Technology, must complete all the courses listed in the curriculum except those marked with an asterisk, which are required for certification by the American Chemical Society Committee on Professional Training. Additionally, Ge 7 is strongly recommended. The department also recommends that the requirement in the Humanities and the Social Sciences be met by a one-year course in each of the two categories plus sufficient other courses in either area to meet the college requirements.

The requirement in German may be met by examination if the student can present evidence to the Department of Chemistry that he is sufficiently familiar with the language.

Superior students should seriously consider continuing their studies at the graduate level and should plan on meeting only minimum ACS requirements so that they can include in the undergraduate program a second language, advanced mathematics, and advanced physics.

For chemistry courses in the Summer Session, see the Summer Session Bulletin.

For a description of courses in biochemistry, see the list of courses given by the Department of Biochemistry.

Graduate Work in Chemistry

The Department of Chemistry offers a program of study and research leading to the M.S. and Ph.D. degrees. The general requirements for advanced degrees are described in the general section of the Graduate School Catalog. Specific requirements for admission to advanced study in chemistry and information about the programs of study offered are given in the chemistry section of the catalog.

CHEMISTRY CURRICULUM

Freshman Year. See Page 290

Sophomore Year

FALL SEMESTER

		Subject	Hours Rec.	Lab.	Cr
Ch	140	Quantitative Anal.	2	6	4
Ch	151	Organic Chemistry Lecture	3	0	3
Ch	161	Organic Chemistry Laboratory	0	4	2
Ms	28	Anal. Geometry and Calculus	4	0	4
		Soc. Sci. Elective.			3

SPRING SEMESTER

		Subject	Hours Rec.	Lab.	Cr
Ch	152	Organic Chemistry Lecture	3	0	3
Ch	162	Organic Chemistry Laboratory	0	4	2
Sh	1	Public Speaking	3	0	3
		Soc. Sci. Elective.			3
*Ms	29	Differential Equations	4	0	4
Ge	7	Computer Programming			2

Junior Year

			Rec	Lab or Comp	Cr
Ch	171	Physical Chemistry	3	5	5
Gm	1	Elementary German	3	0	3
		Hum. Elective			3
		Other Elective(s)			3-6

			Rec	Lab or Comp	Cr
Ch	172	Physical Chemistry	3	5	5
*Ch	190	Intermediate Organic Chemistry Lab	1	4	3
Gm	2	Elementary German	3	0	3
		Hum. Elective			3
		Other Elective			0-3

Senior Year

			Rec	Lab or Comp	Cr
Ch	154	Adv. Inorganic Chemistry	3	0	3
*Ch	185	Chem. Literature	2	0	2
Gm	13	Scientific German	3	0	3
		Electives			6

			Rec	Lab or Comp	Cr
*Ch	164	Instrumental Analysis	2	6	4
Eh	17	Adv. Prof'l. Writing	2	0	2
		Soc. Sci. or Hum. Elective			3
		Other Electives			6

* Required for American Chemical Society certification.

Courses in Chemistry (Ch)

11/12. General Chemistry—Descriptive chemistry and qualitative applications of principles are stressed. History of some of the concepts of modern chemistry is explored. Sufficient familiarity with high school algebra to handle elementary problems is presumed. Recommended as a terminal course. *Rec* 3, *Lab* 3, *Cr* 4.

13/14. Chemical Principles—Study of a restricted number of topics in sufficient detail to provide the student with a foundation for subsequent work in more advanced courses in science and engineering. Quantitative applications are stressed. Recommended for students seriously interested in science, engineering and the teaching of secondary school science. *Rec* 3, *Lab* 3, *Cr* 4.

41. Quantitative Analysis—Similar to Ch 140 except that fewer laboratory determinations are made. Prerequisite: Ch 14. *Rec* 2, *Lab* 3, *Cr* 3.

99. Undergraduate Thesis—The thesis will embody the result of an original investigation carried out in the library and in the laboratory. Open only to seniors with the consent of the department head. *Cr* 1 to 3.

140. Quantitative Analysis—An introductory course illustrating the fundamental principles of gravimetric and volumetric analysis. Prerequisite: Ch 14. *Rec* 2, *Lab* 6, *Cr* 4.

151/152. Organic Chemistry Lecture—An introduction to the chemistry of carbon compounds. Prerequisite: Ch 14. *Rec* 3, *Cr* 3.

154. Advanced Inorganic Chemistry—Advanced theoretical and descriptive inorganic chemistry emphasizing periodic relationships. Prerequisite: Ch 14 and 140. Corequisite: Ch 171. *Rec* 3, *Cr* 3.

155. Advanced Inorganic Chemistry—A systematic study of the preparation and physical and chemical properties of nonorganic materials emphasizing periodic trends. Prerequisite: Ch 154. Corequisite: 172. *Rec* 3, *Lab* 3, *Cr* 4.

161/162. Organic Chemistry Laboratory—An introduction to the synthesis and study of organic compounds in the laboratory. Prerequisite: credit or concurrent registration in Ch 151/152. *Lab* 4, *Cr* 2.

164. Instrumental Analysis—Emphasis on instrumental methods. Prerequisite: Ch 140. Corequisite: Ch 172. *Rec* 2, *Lab* 6, *Cr* 4.

169/170. Physical Chemistry—The lecture portion only of Ch 171/172. Prerequisite: Ch 14, Ps 2 or 2a, Ms 28 and permission of the department. *Rec* 3, *Comp* 1, *Cr* 3.

171/172. Physical Chemistry—A detailed study of fundamental principles of chemistry and their applications. Prerequisite: Ch 41 or 140, Ps 2 or 2a, Ms 28. *Rec* 3, *Comp* 1, *Lab* 4, *Cr* 5.

179. Advanced Physical Chemistry Laboratory—An advanced laboratory course with emphasis on the use of physico-chemical methods. Given on sufficient demand. Prerequisite: Ch 172. *Lab* 6 or 8, *Cr* 3 or 4.

180. Radiochemistry—(Not available 1969-70.) Chemical aspects of nuclear properties and processes. Application of techniques involving radioactivity to chemical problems. Given on sufficient demand. Prerequisite: Ch 172. *Lab* 6 or 8, *Cr* 3 or 4.

185. Chemical Literature—A study of methods for searching the chemical literature. Prerequisite: Ch 152 and elementary German. *Rec* 2, *Cr* 2.

190. Intermediate Organic Chemistry Laboratory—An introduction to the isolation, identification and semi-micro scale preparation of organic compounds. Prerequisite: Ch 152; Ch 162. *Rec* 1, *Lab* 4, *Cr* 3.

Graduate Courses in Chemistry

213. The Chemistry of Cellulose and Wood Components—*Rec* 3, *Cr* 3.

251. Topics in Advanced Organic Chemistry—*Rec* 2, *Cr* 2.

256. Theoretical Organic Chemistry—*Rec* 3, *Cr* 3.

271. Topics in Advanced Physical Chemistry—*Rec* 2, *Cr* 2.

276. Physico-Chemical Methods—*Rec* 2, *Cr* 2.

277. Intermediate Physical Chemistry—*Rec* 3, *Cr* 3.

278. Intermediate Physical Chemistry—*Rec* 3, *Cr* 3.

289. Advanced Organic Chemistry Laboratory—*Lab* 6 or 8, *Cr* 3 or 4.

290. Organic Qualitative Analysis—*Lab* 8, *Cr* 4.

291. Intermediate Organic Chemistry—*Rec* 3, *Cr* 3.

295. Chemical Thermodynamics—*Rec* 3, *Cr* 3.

351. Topics in Advanced Organic Chemistry—*Rec* 2, *Cr* 2.

353. The Chemistry of Organic Sulfur Compounds—*Rec* 2, *Cr* 2.

354. The Chemistry of Heterocyclic Compounds—*Rec* 2, *Cr* 2.

361. Topics in Advanced Inorganic Chemistry—*Rec* 2, *Cr* 2.

371. Topics in Advanced Physical Chemistry—*Rec* 2, *Cr* 2.

373. Statistical Thermodynamics—*Rec* 3, *Cr* 3.

374. Colloid and Surface Chemistry—*Rec* 2, *Cr* 2.

395. Graduate Seminar—*Rec* 1, *Cr* 1.

398. Graduate Research—*Cr Ar.*

399. Graduate Thesis—*Cr Ar.*

CIVIL ENGINEERING

PROFESSORS GORRILL, SPROUL, TAYLOR, WADLIN; ASSOCIATE PROFESSORS GREENWOOD, HAMILTON (CHAIRMAN), NIGHTINGALE; ASSISTANT PROFESSORS DUNTON, FURBER*, HALL, GHOSH, WOODARD; MR. LORD, MR. SHEA, MR. WEST

The Civil Engineering curriculum provides a broad understanding of engineering problems in general and at the same time provides for specialization in several branches of civil engineering and in the field of public management. The curriculum is broad enough to qualify graduates with the bachelor of science degree to start in any field of civil engineering. However, special emphasis is placed upon highway engineering, sanitary engineering, and structural engineering. While graduates with the B.S. degree may go directly into Town Management, the Public Management option specifically prepares graduates for a fifth year in the Department of Political Science, at the end of which they receive degrees of master of arts in public management. Arrangements for this program are made with the head of the Department of Political Science.

While the foundation of all engineering is highly technical, an attempt is made throughout to help the student sense the broader aspects of engineering problems. In addition to this, studies in the social sciences and humanities are included to assist the graduate to assume an administrative position in his chosen field.

A Pulp and Paper Option is available in collaboration with the Chemical Engineering Department. This five-year program leads to the degree of bachelor of science in civil engineering and a certificate in Pulp and Paper. See page 321 for course requirements.

Graduate Program in Civil Engineering

Graduate programs are well established in the fields of sanitary engineering, highway engineering, soils and structural engineering. The graduate program is flexible enough to meet the student's personal desires. The general program will include advanced courses in the student's major field which will constitute approximately half to three-quarters of his requirements. The remainder of the program will consist of advanced courses in mathematics, non-technical courses, and the graduate thesis. This general program leads to the degree of master of science in civil engineering. A graduate program is also available that leads to the doctor of philosophy degree in sanitary engineering.

*On leave of absence 1969-70.

CIVIL ENGINEERING CURRICULUM

A minimum of 127 degree hours

Freshman Year. See Page 290

Sophomore Year

			Rec.	Lab.	Cr					Rec.	Lab.	Cr
Ms	28	Calculus	4	0	4	Ms	29	Cal. Diff. Equ.	4	0	4
Ce	5	Surveying	2	3	3	Ce	28	Highway Engr.	3	0	3
Me	50	Statics	3	0	3	Me	51	Strength of Mat'l.	4	0	4
Gc	7	Computer Prog.	1	2	2	Ee	41	Elec. Circuits	3	0	3
		Non Tech. Elective			3			Non Tech. Elective			3
					15						17

Junior Year

			Rec.	Lab.	Cr					Rec.	Lab.	Cr
Ce	40	Structures I	3	3	4	Ce	41	Structures II	3	3	4
Ce	31	Sanitary Eng. I	3	0	3	Ce	32	Sanitary Eng. II	3	0	3
Ce	26	Hydraulics	3	3	4	Gy	6	Geology	2	2	3
Ce	30	Transportation	3	0	3	Ce	20	C. E. Mat'l.	3	3	4
		Non Tech. Elective			3			Non Tech. Elective			3
					17						17

Senior Year

			Rec.	Lab.	Cr					Rec.	Lab.	Cr
Me	52	Dynamics	3	0	3	Ce	61	Engr. Relations	2	0	2
Ce	42	Structures III	3	3	4	Ce	176	Soils Engr.	3	0	3
Ce	65	Soils Mechanics	2	2	3	Ce	101	Planning Eng. Proj.	3	0	3
		Tech. Elective			3			Tech. Elective			3
		Non Tech. Elective			3			Non Tech. Elective			3
					16						14

Public Management Option

The Public Management Option is designed to give the civil engineering student some of the basic tools of government administration at the local level, in preparation for administration of public works departments, city or town managerships, etc. It is strongly recommended that students interested in careers in local government follow the option with a fifth year leading to a master's degree in public management in the College of Arts and Sciences. The following courses are recommended.

			Hours
Ec	½	Principles of Economics	6
Pol	½	Introduction to Government	6
Pol	7.8	Maine Government	2
Pol	133	The American City	3
Pol	134	Municipal Administration	3
Pol	151	Public Administration	2
Pol	152	Administrative Law	3
Pol	195	Municipal Internship*	3
Pol	200	City and Regional Planning	2

* (Summer at end of junior year)

Courses in Civil Engineering (Ce)

5. Surveying—Surveying instruments and their use and the various methods commonly used for plane surveying. The geometry of simple and vertical curves. Prerequisite: Ms 1. *Rec* 2, *Cr* 3.

20. Materials—The properties of materials which are significant in building and highway construction and how they are determined. The selection of materials to fulfill given requirements. Prerequisite: Me 51. *Rec* 3, *Lab* 3, *Cr* 4.

26. Hydraulics—An elementary course presenting fundamental principles of fluid flow and their applications to engineering problems. Includes study of hydrostatics, liquid measuring devices, and channel and pipe flow. Prerequisite: Me 50, *Rec* 3, *Cr* 4.

28. Highway Engineering Fundamentals — The principles of highway economics, finance and planning are presented and utilized in the basic analysis, location, and geometric design of highway transportation routes. Prerequisite: Ce 5. *Rec* 3, *Cr* 3.

30. Transportation Engineering—The history and development of transportation systems, their components, means of propulsion, limitations, operation characteristics, terminal requirements and the economic comparison and planning of the various systems. Prerequisite: Ce 28 or consent of instructor. *Rec* 3, *Cr* 3.

31. Introduction to Sanitary Engineering—Determination of water volume and quality requirements; wastewater volumes; development and distribution of water; protection of stream water quality. Prerequisite: Ce 26 or equivalent or concurrently. Rec 3, Cr 3.

32. Sanitary Engineering Design—Study and design in problems involved in providing municipal water supplies, sewers, wastewater treatment and stream pollution control. Prerequisite: Ce 31 and Ce 26. *Rec* 3, *Cr* 3.

40. (Structures I) Determinate Structural Analysis and Design—The determination of maximum stresses and strains, the selection of members and the design of connections for beams, girders and trusses. Prerequisite: Me 51. *Rec* 3, *Lab* 3, *Cr* 4.

41. (Structures II) Indeterminate Structural Analysis and Design—The analysis of indeterminate beams, frames, and trusses using virtual work, moment area, slope deflection and moment distribution. The design and detailing of steel frames and trusses. Prerequisite: Ce 40. Rec 3, Lab 3, Cr 4.

42. (Structures III) Reinforced Concrete Structures—The design and detailing of reinforced concrete structures; buildings, retaining walls and footings using the latest ACI requirements. Prerequisite: Ce 41. *Rec* 3, *Lab* 3, *Cr* 4.

61. Engineering Relations—Business phases of engineering. The ethical and legal relations among the parties affected by the making of an engineering contract. Specifications for elementary portions of engineering works. Prerequisite: Ce 20 and 52. *Rec* 2, *Cr* 2.

65. Soil Mechanics—A study of the fundamental physical properties behavior and performance of soil as a construction material. Prerequisite: Me 51. *Rec* 2, *Lab* 2, *Cr* 3.

68. Highway Engineering—Highway location and relocation, including plans of proposed improvement; subgrade structure; base courses and low type pavements. Prerequisite: Ce 28. *Rec* 2, *Lab* 3, *Cr* 3.

99. Thesis—The study of and report upon some original investigation of design. Time to be arranged. *Cr* 2 or 3.

101. Planning Engineering Projects—CPM, PERT, resource leveling, work study, linear programming, and related operations research techniques applied to the planning and scheduling of engineering projects. Prerequisite: Gc 7 and senior standing or consent of instructor. *Rec* 3, *Cr* 3.

155. Hydrology—Application of statistical analysis to rainfall and runoff. The collection and presentation of factors affecting rainfall and runoff data. Methods for developing hydrographs and flood routing. Prerequisite: Ce 26 or the equivalent. *Rec* 3, *Cr* 3.

171. Sanitary Engineering—Water purification, design and operational control of water treatment plants. Prerequisite: Ce 32. *Rec* 2, *Lab* 3, *Cr* 3.

172. Highway Engineering — Various highway problems; rights of way; traffic engineering; drainage; high type pavements and maintenance. Prerequisite: Ce 68. *Rec* 2, *Lab* 3, *Cr* 3.

174. Sanitary Engineering—The theory and design of wastewater disposal works, followed by brief studies of municipal and rural sanitation. Prerequisite: Ce 171. *Rec* 2, *Lab* 3, *Cr* 3.

176. Soils Engineering — The application of soil mechanics to common engineering design and construction. Prerequisite: Ce 65. *Rec* 2, *Cr* 2.

178. Chemistry in Sanitary Engineering — Elementary principles of organic, physical and colloidal chemistry and their use and significance in sanitary engineering practice. Analytical chemistry and tests as related to water. Prerequisite: Ch 2 or equivalent and Ce 131. *Rec* 2, *Lab* 3, *Cr* 3.

179. Microbiology in Sanitary Engineering—Basic principles of biochemistry and microbiology, disinfection, enteric organisms, biology of wastewater treatment, natural purification of streams and disease-producing organisms. Prerequisite: Ce 178 or equivalent; may be taken concurrently. *Rec* 2, *Lab* 6, *Cr* 4.

181. Seminar—Written and oral reports with discussions on assigned topics in any special branch of civil engineering. *Rec* 1-3, *Cr* 1-3.

192. Indeterminate Structures — The analysis of indeterminate beams, trusses and frames using the methods of moment-area, elastic weights, conjugate beam, 3-moment theorem, elastic center, column analogy, slope-deflection, and moment distribution. Prerequisite: Ce 41. *Rec* 3, *Cr* 3.

Graduate Courses

200. City and Regional Planning—*Rec* 2, *Lab* 2, *Cr* 3.
205. Traffic Operations and Geometric Design—*Rec* 3, *Lab* 3, *Cr* 4.
206. Traffic Flow Theory—Rec 2, Lab 2, Cr 3.
230. Water Resources Engineering—*Rec* 3, *Cr* 3.
240. Radiological Health—*Rec* 2, *Lab* 3, *Cr* 3.
300. Traffic Planning I—*Rec* 3, *Cr* 3.
301. Traffic Planning II—*Rec* 3, *Cr* 3.
303. Urban Transportation Planning—*Rec* 3, *Lab* 3, *Cr* 4.
310. Transportation Systems and Terminal Design—*Rec* 3, *Cr* 3.
320. Water Treatment Theory—*Rec* 3, *Cr* 3.
322. Sewage Treatment Theory—*Rec* 3, *Cr* 3.
323. Industrial Wastes—*Rec* 2, *Lab* 6, *Cr* 4.

324. Public Health Engineering—*Rec* 3, *Cr* 3.
330. Sanitary Eng. Design I—*Rec* 2, *Lab* 4, *Cr* 3.
331. Sanitary Eng. Design II—*Rec* 2, *Lab* 4, *Cr* 3.
350. Sanitary Eng. Seminar—*Rec* 1, *Cr* 1.
364. Advanced Soil Mechanics—*Rec* 2, *Lab* 6, *Cr* 4.
365. Advanced Soil Mechanics—*Rec* 3, *Cr* 3.
366. Highway Soils Engineering—*Rec* 3, *Lab* 3, *Cr* 4.
370. Advanced Soils Laboratory—*Lab* 6, *Cr* 2.
376. Foundations and Underground Structures—*Rec* 3, *Cr* 3.
390. Vibrations of Structures—*Rec* 3, *Cr* 3.
391. Numerical Analysis of Structures—*Rec* 3, *Cr* 3.
392. Rigid Frames and Arches—*Rec* 3, *Cr* 3.
393. Folded Plates, Domes and Shells—*Rec* 3, *Cr* 3.
394. Structural Members—*Rec* 3, *Cr* 3.
395. Advanced Indeterminate Structures—*Rec* 3, *Cr* 3.
396. Advanced Reinforced Concrete Structural Design—*Rec* 3, *Cr* 3.
397. Plastic Design in Steel—*Rec* 3, *Cr* 3.
398. Selected Civil Engineering Topics
399. Graduate Thesis

ELECTRICAL ENGINEERING

PROFESSORS GIBSON, CROSBY, LIBBEY, PARSONS, SHEPPARD, TURNER; ASSOCIATE PROFESSORS BROWN, IRONS, (on leave) YOUNG; ASSISTANT PROFESSORS EDE, FIELD, HAMILTON, OTTO, VETELINO, WHITNEY; MR. MARSHALL

The Electrical Engineering undergraduate curriculum consists of a logical sequence of courses firmly rooted in basic science and mathematics, progressing upward through engineering sciences, and culminating in a wide variety of courses in the specific subject areas of electrical engineering.

Central to the curriculum are integrated course sequences in circuit and network analysis, solid-state electronics, fundamentals of electromechanical energy conversion and control, electromagnetic fields, and communication theory. Opportunity is provided in the senior year for each student to elect courses in electroacoustics, communication theory and systems, digital and analog computer systems and applications, feedback control systems, illuminating engineering, electric power transmission and systems, engineering management, and advanced mathematics.

Through this solid foundation in electrical engineering, which is accompanied by introductory studies in chemistry, classical and modern physics, thermodynamics, and properties of materials, the curriculum provides a sound educational base for grade study as well as for employment in any of the broad spectrum of job opportunities in the electrical and related industries.

Special Program in Electrical Engineering

A special five-year program in Pulp and Paper Technology is available to electrical engineering students with options in management and computer engineering. This program superimposes certain requirements in the senior year, and provides for the awarding of the bachelor of science in electrical engineering degree at the end of the senior year and a certificate in pulp and paper management or pulp and paper computer engineering at the end of the fifth year.

Graduate Work in Electrical Engineering

A program of graduate study leading to the degree of master of science in electrical engineering provides course offerings in feedback control systems, system transients, electrical power systems, statistical communication theory, electroacoustics, electro-magnetic waves, microwave circuits, analog and digital computer systems, pulse and digital circuits, and network synthesis. As a condition for acceptance as a candidate for the degree, the student must have obtained honor grades in a large portion of his major undergraduate work.

Freshman Year. See Page 290

Sophomore Year

		Subject	Hours			Subject	Hours
Ee	1	Circuit Anal. I	5	Ee	2	Circuit Anal. II	3
Cp	11	Literature*	3	Ee	12	Basic Elect. Lab.	2
Gc	7	Computer Programming	2	Ms	29	Diff. Eq.	4
Ms	28	Analyt. & Calculus	4	Me	52	Applied Mech.	3
Me	55	Statics and Strength	3	Ps	36	Modern Phys. for Eng.	3
				**		Humanities Elect.	3
			17				18

* Any other literature or Comparative Literature course offered by the Department of English for which the student can qualify may be substituted.

Junior Year

Ee	3	Circ. Anal. III	4	Ee	31	Elements of Comm.	3
Ee	13	Electronics I	3	Ee	14	Electronics II	3
Ee	23	Electromech. Energy Conv. I	3	Ee	25	Electromech Energy Conv. II	3
Ee	17	Ee Laboratory	3	Ee	18	Ee Laboratory	3
**		Humanities Elect.	3	**		Humanities Elect.	3
			16				15

Senior Year

Ee	150	E-M Fields	3	Me	33	Thermodynamics I	3
Ee	161	Electronics III	4	**		Humanities Elect.	3
**		Humanities Elect.	3	***		Technical Electives	9
***		Technical Electives	6				
			16				15

**Refers to non-technical Electives. 18 credit hours required with a minimum of 6 in each area.

***Technical electives include upper-level Electrical Engineering courses, Ms 153/154, Ms 187 and Ms 196. Certain other mathematics, physics and engineering courses may be substituted with special permission. Each student's selection of five technical electives must be approved by his adviser during preregistration in the spring semester of his junior year.

Lower Level Courses

Circuits, Fields and Systems

1. Basic Circuit Analysis I—Basic laws and theorems of electric circuits; complete solution of first and second order systems; a-c steady state analysis. Prerequisite Ps 2 and Ms 27. *Rec* 4, *Comp or Lab* 3, *Cr* 5, for Ee majors; *Rec* 4, *Cr* 4, for EP's majors.

2. Basic Circuit Analysis II — Complex frequency analysis, poles and

zeroes, frequency response; transformers; three phase circuits; Fourier series. Prerequisite Ee 1. *Rec* 3, *Cr* 3.

3. Circuit Analysis III—The complex frequency plane and its application; Fourier analysis; Fourier and LaPlace transforms; two-part networks. Prerequisites: Ee 2; Ee 17 required concurrently. *Rec* 3, *Comp* 2, *Cr* 4.

Materials, Electronic Devices and Electronics

12. Basic Electrical Laboratory—Use of techniques developed in Ee 1, 2 for the analysis of circuits containing linear, nonlinear, passive and active elements; includes analysis of simple electronic circuits and the use of the oscilloscope. Prerequisite: Ee 2 required concurrently. *Rec* 1, *Lab* 3, *Cr* 2.

13. Electronics I—Conduction mechanisms in metals and semiconductors; physics of semiconductor devices; piecewise linear circuit models and parameters of devices; biasing and stability. Prerequisite: Ee 12, Ps 36; Ee 17 required concurrently. *Rec* 3, *Cr* 3.

14. Electronics II — Transistor amplifier circuits; high-frequency device models; field-effect transistors; integrated circuits; time and frequency domain response; feedback; oscillator circuits. Prerequisite: Ee 13 or consent of the department; Ee 18 required concurrently. *Rec* 3, *Cr* 3.

17/18. Electrical Engineering Laboratory—A laboratory course concurrent with and related to Ee 13, 14 and Ee 23, 25. Written reports are required and techniques of presentation as well as technical accuracy are stressed. Prerequisite: Ee 12; concurrent Ee 13/14 and Ee 23/25. *Rec* 1, *Lab* 3, *Cr* 1 to 3.

Energy Conversion, Machines and Control

23. Electromechanical Energy Conversion I — Characteristics of transformers, the torque equation, three-phase induction motors, synchronous machines, direct-current machines. Prerequisite: Ee 2, co-requisite Ee 17. *Rec* 3, *Cr* 3.

25. Electromechanical Energy Conversion II — Characteristics of two-phase servo motors and single phase induction motors; a-c tachometer generators; synchros and induction resolvers; system dynamics and transfer functions; direct energy conversion. Prerequisite: Ee 23, co-requisite Ee 18. *Rec* 3, *Cr* 3.

Communication, Information Theory, and Computer Theory

31. Elements of Communication — Characteristics of the auditory and vocal systems; elements of vision; colorimetry; basic information theory; physiological probability; coding and decoding of information; cybernetics; noise; storage of information; switching circuits; principles of feedback and automation. Prerequisite: Ps 2 and Ms 27. *Rec* 3, *Cr* 3.

Service Courses

41. Elementary Circuits—An introduction to d-c and a-c circuits analysis for students majoring in fields other than electrical engineering. Prerequisite: Ms 27, Ps 2. *Rec* 3, *Cr* 3.

42. Electric Machinery—An introduction to magnetic circuits and electromechanical energy conversion devices for students majoring in fields other than electrical engineering. Prerequisite: Ee 41. *Rec* 3, *Cr* 3.

43. Electronics—An introduction to electronic devices and circuits for students majoring in fields other than electrical engineering. Prerequisite: Ee 41. *Rec* 1½, *Lab* 1½, *Cr* 3.

Upper Level Courses

Circuits, Fields, and Systems

150. Electromagnetic Fields—Solution of static electric and static magnetic field problems by methods of vector analysis; boundary value conditions; derivation of Maxwell's equations; introduction to time-varying electromagnetic fields. Prerequisite: Ms 29. *Rec* 3, *Cr* 3.

153. Microwave Transmission — High frequency lossy and lossless lines; propagation of waves in free space; antennas; wave guides. Prerequisite: Ee 150. *Rec* 2, *Comp* 3, *Cr* 3.

155. Electric Power Transmission—Line constants, EHV transmission calculations, distributed parameters, traveling wires and reflections, lighting, corona, ABCD constants, circle diagrams. Prerequisite: Ee 2, 23. *Rec* 2, *Comp* 3, *Cr* 3.

156. Electric Power Systems — Power systems representing matrix formation, symmetrical component theory, stability and fault calculations. Load flow studies using digital computers and network analyzer techniques. Prerequisite: Ee 155. *Rec* 2, *Comp or Lab* 3, *Cr* 3.

Materials, Electronic Devices and Electronics

161. Electronics III—Continuation of Ee 14; narrow- and wide-band amplifiers, power amplifiers, modulation and demodulation techniques, regenerative and non-regenerative switching circuits and waveform generators. Prerequisite: Ee 14, Ee 3. *Rec* 3, *Lab* 3, *Cr* 4.

164. Electronics and Communication Laboratory — Measurement techniques, generation, amplification, and shaping of waveforms; noise; modulation and demodulation; solid-state circuit design; integrated circuits. Prerequisite: Ee 161. *Rec* 1, *Lab* 4, *Cr* 3.

Energy Conversion, Machines, and Control

171. Servomechanism Fundamentals — Analysis of feedback control systems using frequency- and time-domain techniques, s-plane, Bode, Nichols and state-variable approaches. Introduction to compensation-network design. Prerequisite: Ee 3, Ee 25, Ms 29, or permission. *Rec* 2, *Comp or Lab* 3, *Cr* 3.

173. Industrial Electrical Control—Study of manual and automatic control of motors, and feedback methods in regulated systems using rotating amplifiers and static switching devices such as silicon-controlled rectifiers and magnetic amplifiers. Prerequisite: Ee 23. *Rec* 3, *Cr* 3.

Communication, Information Theory, and Computer Theory

180. Analog and Digital Computer Systems—Analog computer applications including solution of non-linear equations, partial differential equations and boundary-value problems. Special analog elements, direct programming, iterative operations and approximation techniques. Introduction to digital computer logic, Boolean algebra, codes, switching networks, logic and binary arithmetic circuits. Prerequisite: Ms 29, Ee 14. *Rec* 3, *Cr* 3.

183. Probabilistic Methods in Electrical Engineering — The elements of engineering probability theory including both the discrete and continuous cases with particular emphasis on the application to problems in electrical communication. Prerequisite: Ee 3, Ms 29. *Rec* 3, *Cr* 3.

184. Communication Systems — Time- and frequency-domain representations of signals, energy density, translation, sampling noise and noise figures, modulation, elements of probability, and information theory. Prerequisite: Ee 3, and 161. *Rec* 3, *Cr* 3.

Miscellaneous

191. Illuminating Engineering—General and advanced illumination theory, illuminating sources and their application, photometry, interior and exterior lighting problems, national electric code, design of electric distribution systems for buildings and for exterior lighting. Prerequisite: Ee 2, or 41. *Rec* 2½, *Lab* 1, *Cr* 3.

194. Engineering Administration — Executive techniques in engineering organizations, including capitalization and amortization, engineering surveys and planning, labor relations and utilizaton, time and motion study, statistical quality control, technical purchasing and inventory control, safety programs, and patent applications. Open only to upperclass and graduate students. *Rec* 3, *Cr* 3.

196. Electro-Acoustics—Fundamentals of acoustic waves; electromechanical and acoustical circuits; radiation; electro-acoustic systems of microphones and loudspeakers; architectural acoustics; sound measuring systems; noise reduction. Prerequisite: Senior or Graduate standing. *Rec* 3, with four laboratory periods substituted for equivalent class time. *Cr* 3.

198. Selected Topics in Electrical Engineering—Topics in electrical engineering not regularly covered in other courses. The content is not fixed but can be varied to suit current needs. The course may, with permission of the department, be taken more than once. Prerequisite: consent of the department. *Cr* 1-3.

Thesis

199. Thesis—The study of and report upon some original investigation or design. See regulations regarding degrees. *Cr* 1-3.

Graduate Courses

222/223. Transients in Linear Systems—*Rec* 3, *Cr* 3.
235. Advanced Electric Power Systems—*Rec* 3, *Cr* 3.
237. Power System Protection and Relaying—*Rec* 3, *Cr* 3.
240/241. Introductory and Applied Network Synthesis — *Rec* 3, *Cr* 3;
242. Computer Methods in Network Analysis—*Rec* 3, *Cr* 3.
250. Electromagnetic Waves—*Rec* 3, *Cr* 3.
260/261. Pulse and Digital Circuits—*Rec* 3, *Cr* 3.
263. Microwave Circuits—*Rec* 3, *Cr* 3.
271. Modern Control Theory—*Rec* 3, *Cr* 3.
272. Non-Linear Control Systems—*Rec* 3, *Cr* 3.
273. Sampled Data Control Systems—*Rec* 3, *Cr* 3.

280/281. Statistical Communication Theory—*Rec* 3, *Cr* 3.
295. Communication Seminar—*Rec* 2, *Cr* 2.
298. Selected Advanced Topics in Electrical Engineering—*Cr* 1-3.
399. Graduate Thesis—*Cr* 6-10.

ENGINEERING PHYSICS

PROFESSORS CAMP, BENNETT, BISCOE, CARR, AND KRUEGER; ASSOCIATE PROFESSORS COFFIN, EDGERTON, HARMON, AND TODD; ASSISTANT PROFESSORS BROWNSTEIN, CLARK, HESS, ROCKMORE, SMITH, AND TARR; MR. R. G. LITTLEFIELD, MR. R. H. LITTLEFIELD

This curriculum is an answer to an established demand on the part of industry for college men trained in physics in an engineering atmosphere. It recognizes the fact that for certain students, undergraduate specialization in a single engineering field is not a rigid requirement for success in industrial work, especially if there is evidence of concentration on the scientific principles underlying engineering. This program is basically one of applied science, supplemented by a sequence of technical electives in one or more of the well-defined engineering or science fields. It is developed around a framework of required courses in intermediate and advanced physics, mathematics, and chemistry, in addition to certain strictly engineering courses, some required and some elected in the last two years. Thus, the emphasis is placed upon both engineering and physics.

The curriculum also is suited for those students who, by virtue of their ability and interest, may be preparing to do graduate work. Graduates have successfully pursued graduate study in physics and in various fields of engineering.

Graduate Work in Physics

Graduate opportunities and requirements for the master of science degree and the doctor of philosophy degree in physics are given in the catalog of the Graduate School.

Freshman Year. See Page 290

Sophomore Year

		FALL SEMESTER	Rec.	Lab.	Cr.			SPRING SEMESTER	Rec.	Lab.	Cr.
		*Hum. Elective (Bands I or II)	3	0	3	Ge	7	Computer Programming	1	2	2
Me	7	Mach. Processes	0	3	1			*Hum. Elective (Bands I or II)	3	0	3
Ms	28	Anal. Geom. & Calculus	4	0	4	Ms	29	Ord. Diff. Equations	4	0	4
Ps	17	Intermed. Physics	2	0	3	Ps	18	Intermed. Physics	2	0	3
Ps	19	Intermed. Laboratory	0	2	1	Ps	20	Intermed. Laboratory	0	2	1
Ps	36	Intro. to Modern Physics	3	0	3	Ps	172	Optics	3	0	3
			Total		15				Total		16

Junior Year

FALL SEMESTER			Rec.	Lab.	Cr.
Ee	1	Electric Circuits	4	0	4
		*Hum. Elective	3	0	3
Me	55	Statics & Strength of Materials			3
Ms	153	Part. Diff. Equations	3	0	3
Ps	153	Elec. Measurements	0	4	2
Ps	155	Electricity & Magnetism	3	0	3
				Total	18

SPRING SEMESTER			Rec.	Lab.	Cr
Ee	2	Electric Circuits	3	0	3
		*Hum. Elective	3	0	3
Me	33	Thermodynamics I	3	0	3
Ms	154	Part. Diff. Equations	3	0	3
Ps	169	Atomic Physics	3	0	3
Ps	176	Phys. Measurements	0	4	2
				Total	17

Senior Year

FALL SEMESTER			Rec.	Lab.	Cr
		**Engineering Electives	3	0	3
			3	2	4
		*Hum. Elective	3	0	3
***Ms		Math Elective	3	0	3
		†Physics Electives	3	0	3
Ps	181	Advanced Lab	0	6	3
Ps	198a	Seminar	1	0	0
				Total	15-16

SPRING SEMESTER			Rec.	Lab.	Cr
		**Engineering Electives	3	0	3
			3	2	4
		Free Elective	3	0	3
		*Hum. Elective	3	0	3
Ps	182	Advanced Lab	0	6	3
†Ps	196	Physics of Materials or Physics Elective	3	0	3
Ps	198b	Seminar	1	0	1
				Total	16-17

*Humanity Electives—18 hours with not less than 6 hours in each band. Suggestions: Band I, Economics, Psychology, Anthropology, etc. Band II, Foreign Language, Literature, History, Philosophy, etc.

**Engineering Elective—toward completion of 12 hours, but no less than 4 semester courses in an engineering sequence.

***Math Elective may be postponed until spring semester or may be satisfied by Ps 191.

†Senior Physics Electives—Fall Ps 191, Ps 170, Ps 163; Spring Ps 192, Ps 186, Ps 196, plus approved 200 series courses either semester.

GENERAL ENGINEERING

PROFESSOR MCNEARY; ASSOCIATE PROFESSORS DESCHANES, METCALF, WESTFALL; ASSISTANT PROFESSOR KEENE; MR. VIGER

The Department of General Engineering does not have major students, but offers service courses to students majoring in other curricula, principally engineering and forestry.

Courses offered are those that are introductory and general, or commonly required, in all engineering curricula. Introduction to Engineering Design is taught to first-year students through the medium of engineering drawing. Basic instruction in computer programming, both digital and analog, is provided for sophomores in engineering.

The Department of General Engineering is responsible for the orientation and advising of freshman engineering students and offers an orientation course at the freshman level.

General Engineering (Ge)

1/2. Introduction to Engineering Design—Creative exercises in multi-view drawing using freehand and instrumental techniques. Course 2 introduces pictorial drawing, descriptive geometry, and concludes with the preparation of working drawings for an elementary design problem requiring creative thinking. *Rec & Lab* 4, *Cr* 2. STAFF

3. Descriptive Geometry—The solution of problems of a three-dimensional nature by graphic methods. Theoretical and applied problems are given. Prerequisite: Ge 1. *Rec & Lab* 4, *Cr* 2. STAFF

5/6. Orientation—A series of meetings involving lectures and discussions, with frequent use of audio-visual material to acquaint engineering freshmen with the nature of engineering and science. *Rec* 1, *Cr* 0. MR. MCNEARY

7. Computer Programming for Engineers—Digital programming using Fortran IV language and appropriate numerical methods for the solution of applied problems involving roots of equations, numerical integration, and matrix algebra. The last five weeks of the semester are devoted to analog computer exercises, including time and magnitude scaling. Prerequisite: Ms 28 (may be taken concurrently). *Rec* 1, *Lab* 2, *Cr* 2. MR. MCNEARY

12. Forestry Drawing—A further study of multi-view and pictorial drawings with applied problems in cartography and other fields related to forestry. Prerequisite: Ge 1. *Rec & Lab* 4, *Cr* 2. MR. WESTFALL

14. Architectural Drawing — The preparation of floor plans, elevations, sections, and pictorial renderings of homes and small buildings. Prerequisite: Ge 1. *Rec & Lab* 4, *Cr* 2. MR. WESTFALL

150. Nomography—The construction of graphical representations of equations which must be solved repeatedly. Prerequisite: Ge 1, Ms 27. *Rec* 1, *Lab* 2, *Cr* 2. MR. MCNEARY

MECHANICAL ENGINEERING

PROFESSORS SULLIVAN, HILL, LYMAN, CAMPBELL, CLIFFORD; ASSOCIATE PROFESSORS SCHNEIDER, WEBSTER, CHAPMAN, GRANT, SUCEC, LEE, JOHNSON; ASSISTANT PROFESSORS HOPKINS, SCHMIDT; MR. HALL, MR. MADDEN, MR. GROSS

The Mechanical Engineering curriculum uses a broad foundation of mathematics, basic science, and engineering science to prepare the student for more specialized training in advanced courses.

Mechanical engineering embraces two major areas of interest; heat power and mechanical design. Professional careers in mechanical engineering include design, development, research, teaching, management and sales.

The curriculum is designed to allow the student to select electives in the area of his interest and aptitude. Sequences of courses are available in fluid and solid mechanics, thermal science and heat power, mechanical design, and environmental design and control. A minimum of 122 degree hours is required for the bachelor of science degree.

A Pulp and Paper Option is offered in cooperation with the Chemical Engineering Department. The five-year program includes all courses required in the

Mechanical Engineering curriculum and leads to the degree of bachelor of science in mechanical engineering and a certificate indicating completion of the pulp and paper program.

Graduate Work in Mechanical Engineering

The department offers programs leading to the degrees of master of science in mechanical engineering, master of mechanical engineering, and master of engineering (mechanical). The course of study may be chosen in any of the department's fields.

Freshman Year. See Page 290

Sophomore Year

FALL SEMESTER			Lab Rec or Comp		Cr
Ee	41	Elem. Circuits	3	0	3
Ms	28	Anal. Geom. & Calculus	4	0	4
Me	53	Appl. Mech. I, (Statics and Kinematics)	4	0	4
Ps	36	Modern Physics	3	0	3
		Elective			3
					17

SPRING SEMESTER			Lab Rec or Comp		Cr
Ge	7	Computer Programming	1	2	2
Ms	29	Calc. & Diff. Eq.	4	0	4
Me	33	Thermodynamics I	3	0	3
Me	51	Str. of Materials	4	0	4
Me	54	Appl. Mech. II, (Kinetics)	4	0	4
					17

Junior Year

			Lab Rec or Comp		Cr
Ee	43	Electronics	2	2	3
Me	8*	Mfg. Processes	1	4	3
Me	21	Material Science	3	0	3
Me	34	Thermodynamics II	3	0	3
		Elective			3
					15

			Lab Rec or Comp		Cr
Me	38	Mechanical Lab	0	3	2
Me	59	Fluid Mechanics	3	0	3
Me	164	Mech. Vibrations	3	0	3
		*Elective			3
		Elective			3
					14

*Alternated

Senior Year

			Lab Rec or Comp		Cr
Me	71	Mechanical Lab	0	3	2
Me	124	Mechanical Design I	2	3	3
Me	160	Heat Transfer	3	0	3
		Technical Elective			3
		Elective			3
					14

			Lab Rec or Comp		Cr
Ee	42	Electrical Mach.	3	0	3
Me	72	Mechanical Lab	0	3	2
		Technical Elective			3
		**Elective			3
		Elective			3
					14

**Technical or Humanity—Social Science

M. E. Technical Electives

			Rec	Lab or Comp	Cr
Me	84	Indus. Management	3	0	3
Me	94	Hydraulic Machinery	3	0	3
Me	123	Kinematics of Linkages	3	0	3
Me	156	Theory of Elasticity	3	0	3
Me	157	Adv. Dynamics	3	0	3
Me	158	Adv. St. of Materials	3	0	3
Me	167	Direct Energy Conversion	3	0	3
Me	181	Turbomachinery	3	0	3
Me	186	Power Plants	3	0	3
Me	187	Mech. Des. II	2	3	3
Me	188	Dynamics of Machines	3	0	3
Me	189	Prin. Optimum Design & Reliability	3	0	3
Me	190	Adv. Thermodynamics	3	0	3
Me	191	Heat & Vent. Systems	3	0	3
Me	192	Aerodynamics	3	0	3
Me	193	I. C. Engines	3	0	3
Me	195	Gas Dynamics I	3	0	3
Me	196	Air Condg. & Refrig.	3	0	3

PULP AND PAPER OPTION IN MECHANICAL ENGINEERING

The first three years of this program are the same as the regular Mechanical Engineering program, including all specified courses through the junior year with the additional requirement of Ec 1/2, Principles of Economics. The specific requirements for the Pulp and Paper certificate as well as a sample program may be found in the Chemical Engineering section of this catalog.

Courses in Mechanical Engineering (Me)

7. Machine Processes—Theory of metal forming, the machine tools and materials of modern manufacturing, mass production processes, use of basic machine tools. *Rec & Lab* 3, *Cr* 1.

8. Manufacturing Processes—Theory and application of modern metal shaping machines and processes. Design analysis for economical fabrication. Characteristics and operation of machine tools. *Rec* 1, *Lab* 4, *Cr* 3.

11. Introductory Engineering Metallurgy—Methods of defining the microstructure of metals, phase diagrams, and mechanical properties. Thermal, mechanical, and chemical manipulation of microstructure. Not for mechanical engineering degree credit. *Rec* 3, *Cr* 3.

12. Elementary Heat Power—Elementary thermodynamics, mechanical apparatus, power plant equipment; engineering calculations relative to heat, power, work, and mechanical and electrical energy. Not for mechanical engineering degree credit. *Rec* 3, *Cr* 3.

21. Materials Engineering and Science—The principles of material science with emphasis on the relationship between structure and properties and their control through composition, mechanical working and thermal treatment. Prerequisite: Me 34, 51, and Ms 29. *Rec* 3, *Cr* 3.

33. Thermodynamics I—A study of energy and energy transformations; the First and Second Laws applied to systems and to control volumes; thermodynamic properties of systems, availability of energy. Prerequisite: Ps 1, Ms 28. *Rec* 3, *Cr* 3.

34. Thermodynamics II—A continuation of Me 33. Thermodynamics of mixtures; chemical thermodynamics, thermodynamics of fluid flow, vapor and gas cycles, applications to compressors, internal combustion engines and turbines. Prerequisite: Me 33. *Rec* 3, *Cr* 3.

38. Mechanical Laboratory—An introduction to laboratory techniques, instrumentation and calibration of equipment. Application to thermodynamics, mechanics of materials, fluid mechanics, and metallurgy. Prerequisite: M.E. junior. *Lab* 3, *Cr* 2.

50. Applied Mechanics, Statics — The study of force systems and equilibrium, trusses, frames, friction, distributed forces, centroids, and moments of inertia. Prerequisite: Ms 27 and Ps 1. *Rec* 3, *Cr* 3.

51. Strength of Materials—The principles of solid mechanics and their applications to practical problems, stresses and deflections in axial loading, torsion, beams, columns, combined stresses. Prerequisite: Me 50 or Me 53 and Ms 28. *Rec* 4, *Cr* 4.

52. Applied Mechanics, Dynamics—A study of motion of particles and rigid bodies; force, mass and acceleration; impulse and momentum; work and energy and simple harmonic motion. Prerequisite: Me 50, Ms 28. *Rec* 3, *Cr* 3.

53. Applied Mechanics I—The study of force systems and equilibrium, structural models, friction, distributed forces, centroids, and moments of inertia. Analysis of mechanisms. Prerequisite: Ms 27 and Ps 1. *Rec* 4, *Cr* 4.

54. Applied Mechanics II—A study of the motion of particles and rigid bodies; force, mass and acceleration; impulse and momentum; work and energy; harmonic motion. Prerequisite: Me 53 and Ms 28. *Rec* 4, *Cr* 4.

55. Statics and Strength of Materials—The basic principles of statics and their applications in strength of materials. Equilibrium of various systems. Stresses and deformations of axially loaded members, connections, circular shafts, beams and columns. Prerequisite: Ms 27 and Ps 1. *Rec* 3, *Cr* 3.

59. Fluid Mechanics—Fluid statics, kinematics, Bernoulli equation, momentum, free-surface flow, viscosity, pipe friction, dimensional analysis and similtude, and an introduction to compressible flow. Prerequisite: Me 33 and Me 52 or Me 54. *Rec* 3, *Cr* 3.

62. Heat Transfer and Fluid Flow—For non-mechanical engineers. The laws of conduction, convection, and radiation of heat energy. Principles of fluid flow for non-viscous and viscous fluids. Application of the principles of heat transfer and fluid flow to engineering problems. Prerequisite: Me 33. *Rec* 3, *Cr* 3.

71/72. Mechanical Laboratory—Designed experiments to encourage analytical and experiment investigations in the thermal science and solid and fluid mechanics area. Individual student project investigations. Prerequisite: M. E. senior. *Lab* 3, *Cr* 2.

84. Industrial Management—A study of the relation between accounting, marketing, production and wage administration in the modern industrial plant. Prerequisite: M. E. senior. *Rec* 3, *Cr* 3.

94. Hydraulic Machinery—Prerequisite: Me 59. Rec 3, Cr 3.

99. Seminar—*Rec* 1, *Cr* 1.

101. Metallography—Structure, metallic bonding and properties of metals. Solidification, alloying, and constitution diagrams. Deformation and annealing. Prerequisite: Me 21. *Lab* 6, *Cr* 3.

123. Kinematics of Linkages—Analysis of displacement, velocities, and acceleration in machine parts and linkages. Kinematic synthesis of mechanisms, analog and digital computer techniques. Prerequisite: Me 52 or 54. *Rec* 3, *Cr* 3.

124. Mechanical Design I — Analysis of mechanical elements. Advanced concepts in mechanics of materials, stress concentration, fatigue, factor of safety.

Introduction to creative synthesis and economic design. Prerequisite: Me 51 or 55 and Ms 29. *Rec* 2, *Comp* 3, *Cr* 3.

150. Experimental Mechanics—Experimental methods and techniques for analysis of stress, strain and displacement and their engineering significance. Electric strain gages, brittle lacquers, mechanical and optical strain gages, and introduction to photoelasticity. Prerequisite: Me 51. *Rec* 2, *Lab* 3, *Cr* 3.

156. Theory of Elasticity—Plane stress and plane strain, stress function. Problems in Cartesian and polar coordinates. Photo-elasticity, strain energy. Three-dimensional problems. Prerequisite: Me 51. *Rec* 3, *Cr* 3.

157. Advanced Dynamics—Particle dynamics vibrations, numerical methods, planetary motion, projectiles. Variable mass motion, angular momentum, impact, engine balancing. Constraints, generalized coordinates and forces. Lagrange's equations. Hamilton's principle. Gyroscopes. Prerequisite: Me 52 or Me 54. *Rec* 3, *Cr* 3.

158. Advanced Strength of Materials—Limitations of elementary stress formulas, theories of failure, unsymmetrical bending, curved flexural members, flat plates, torsion of non-circular bars, thick-walled cylinders, stress concentrations, energy methods, and introduction to theory of elasticity. Prerequisite: Me 51. *Rec* 3, *Cr* 3.

160. Heat Transfer — A study of the fundamental laws of heat transfer by conduction, convection and radiation. Application of the study of engineering problems via analytical, numerical, and graphical techniques. Prerequisite: Me 59. *Rec* 3, *Cr* 3.

164. Mechanical Vibrations — Free and forced vibrations with viscous damping for discrete and continuous mass systems. Derivation and application of energy methods. Applications. Prerequisite: Me 52 or Me 54. *Rec* 3, *Cr* 3.

167. Direct Energy Conversion — Analysis of direct energy conversion. Energy converters such as thermionic, thermoelectric, photoelectric, fuel cells, and magneto-hydrodynamic generators considered as components of power systems. Prerequisite: Me 33. *Rec* 3, *Cr* 3.

181. Turbomachinery—Fundamental analysis of the theory and design of turbomachinery flow passages; control and performance of turbomachinery; gas-turbine engine process. Prerequisite: Me 34. *Rec* 3, *Cr* 3.

186. Power Plants—Power station engineering and economy. Design, construction and operating theory of steam, internal-combustion, and hydroelectric power plants. An introduction to nuclear power plants, utilization of solar energy, fuel cells, and associated problems. Prerequisite: M. E. senior. *Rec* 3, *Cr* 3.

187. Mechanical Design II—Formulation and design of mechanical elements and systems covering a variety of problems confronting the practicing mechanical engineer. Emphasis on original design problems and the development of creative ability. Prerequisite: Me 124. *Rec* 2, *Comp* 3, *Cr* 3.

188. Dynamics of Machines—The forces due to reciprocating and rotating masses with special application to balancing high-speed machinery, designing governors and flywheels. Prerequisite: Me 164. *Rec* 3, *Cr* 3.

189. Principles of Optimum Design and Reliability—Optimization of mechanical engineering systems, statistical treatment of systems breakdown, utilization of reliability theory in design. Prerequisite: Me 124 or permission. *Rec* 3, *Cr* 3

190. Advanced Thermodynamics I—An introduction to combustion, with applications to the performance of propulsion systems, particularly rocket engines. Prerequisite: Me 34. *Rec* 3, *Cr* 3.

191. Heating and Ventilating System Design—Determination of heating. ventilating requirements for buildings and industrial processes. Analysis of heat transfer devices and their applications. Heating and ventilating system design, layout and control. Prerequisite: Me 34. *Rec* 3, *Cr* 3.

192. Aerodynamics — Flow of an ideal fluid; application of dimensional analysis to engineering problems; properties of airfoils; engine and propeller characteristics; airplane performance calculations; propeller theory. Prerequisite: Me 59. *Rec* 3, *Cr* 3.

193. Internal Combustion Engines—Application of thermodynamic laws and principles to internal combustion engine cycles, theory of design and operation; fuels and combustion, carburetion, detonation, cooling, and lubrication. Prerequisite: Me 34. *Rec* 3, *Cr* 3.

195. Gas Dynamics I—An introduction to the basic dynamics of compressible flows. Fundamental equations and concepts will be considered in isentropic flow, normal shock waves, flows in constant area ducts, and generalized one-dimensional continuous flow. Prerequisite: Me 34 and 59. *Rec* 3, *Cr* 3.

196. Refrigeration and Air Conditioning—Methods of producing artificial low temperatures. Refrigeration for controlled-temperature applications in comfort air conditioning and industrial manufacturing processes and their control. Prerequisite: Me 34. *Rec* 3, *Cr* 3.

Graduate Courses

202. Generalized Classical Thermodynamics—*Rec* 3, *Cr* 3.

203. Advanced Thermodynamics II—*Rec* 3, *Cr* 3.

210. Advanced Heat Transfer I—*Rec* 3, *Cr* 3.

220. Advanced Fluid Mechanics I—*Rec* 3, *Cr* 3.

222. Gas Dynamics II—*Rec* 3, *Cr* 3.

231. Fatigue Theory—*Rec* 3, *Cr* 3.

232. Nonlinear Vibrations—*Rec* 3, *Cr* 3.

233. Theory of Deformation and Stress—*Rec* 3, *Cr* 3.

234. Advanced Vibrations I—*Rec* 3, *Cr* 3.

235. 236. Mechanical Engineering Analysis—*Rec* 3, *Cr* 3.

238. Advanced Vibrations II—*Rec* 3, *Cr* 3.

304. Selected Topics in Advanced Thermodynamics—*Rec* 3, *Cr* 3.

311. Advanced Heat Transfer II—*Rec* 3, *Cr* 3.

312. Advanced Topics in Heat Transfer—*Rec* 3, *Cr* 3.

330. Theory of Plates and Shells—*Rec* 3, *Cr* 3.

391. Mechanical Engineering Projects—*Cr Ar.*

399. Graduate Thesis—*Cr Ar.*

TECHNICAL INSTITUTE DIVISION

College of Technology

ASSOCIATE DIRECTOR R. B. RHOADS

The Technical Institute Division of the College of Technology offers programs leading to an associate of science in engineering technology degree in the following:

Chemical Engineering (pulp & paper) Technology
Civil Engineering Technology
Electrical Engineering Technology
Mechanical Engineering Technology

The objective of the two-year programs is to provide an education for young people who are interested in technical employment at the engineering technican level. The Technical Institute programs are job-oriented and offer specialized training enabling graduates to perform the variety of duties required of them.

Technological advance in all industries has escalated the professional level of the associate degree engineering technician. He is sufficiently trained in the basic sciences and communications to assist in decision making, to plan and conduct experiments with only slight supervision, to analyze and report data effectively, and eventually to assume the full responsibility of a junior engineer.

Successful completion of studies means that the graduate has acquired high technical competence and a foundation for further study. Graduates from the Technical Institute should find ready employment as engineering technicians or as engineering aides in industry and business, with local or state government, or with consulting engineers.

Graduates with superior records from the Technical Institute Division may be considered for admission to the College's degree programs in engineering with the transfer credit to be determined on an individual basis.

Graduation Requirements

For the associate of science in engineering technology degree, a total of 71 credits are required for Chemical Engineering (Pulp and Paper) Technology and 72 credits are required for Civil Engineering Technology, Electrical Engineering Technology, and Mechanical Engineering Technology. A student must accumulate a minimum grade point average of 1.80 and receive a passing grade in all required courses in the program of study.

CHEMICAL ENGINEERING (PULP & PAPER) TECHNOLOGY

The curriculum in Chemical Engineering Technology provides classroom and laboratory training in the principles of chemical engineering practices with emphasis on pulp and paper technology. The program stresses engineering principles but instructs as well in the skills of laboratory research and testing. Training in data analysis, writing and speaking develop in the student an interest and proficiency for communicating his ideas and the results of his work. Successful completion of studies means that the student has acquired the technical competence to assume a strong supporting role in any engineering assignment.

CHEMICAL ENGINEERING (PULP & PAPER) TECHNOLOGY

CURRICULUM

SEMESTER 1

		Subject	Rec	Lab	Cr
CheT	1	Chemical Science	3	0	3
CheT	6	Data Analysis	2	0	2
EhT	1	Eng. Comp.	3	0	3
MsT	2	Basic Mathematics	3	0	3
PaT	1	Pulp Technology	3	0	3
Pe	1	Physical Education	0	2	0
PsT	7	Basic Physics	3	2	4
			17	4	18

SEMESTER 2

		Subject	Rec	Lab	Cr
CheT	2	Chemical Science	3	0	3
CheT	3	Chemical Analysis	0	8	4
MsT	4	Basic Mathematics	3	0	3
PaT	2	Paper Technology	3	0	3
Pe	2	Physical Education	0	2	0
PsT	8	Basic Physics	3	2	4
			12	12	17

SUMMER INTERNSHIP (MILL WORK)

SEMESTER 3

		Subject	Rec	Lab	Cr
CheT	4	Chem. Eng. Elem.	3	0	3
CheT	5	Process Instru.	1	2	2
CheT	8	Data Analysis II	3	0	3
PaT	3	Pulp & Paper Anal.	0	12	6
1	Sh	Oral Communication	3	0	3
			10	14	17

SEMESTER 4

		Subject	Rec	Lab	Cr
2	ARE	Intro. to Economics	3	0	3
CheT	7	Chemical Processes	3	0	3
PaT	4	Unit Processes (P&P)	0	8	4
1	Sh	Oral Communication	3	0	3
		Electives	6	0	6
			15	8	19

Courses in Chemical Engineering (Pulp & Paper Technology) (CheT)

*1/2. **Chemical Science***—Principles of chemistry, with emphasis on their application to engineering. The basics of organic chemistry are introduced and used to discuss important areas of polymers and wood. *Rec* 3, *Cr* 3; *Rec* 3, *Cr* 3.

*3. **Analytical Chemistry***—A study and training in analytical techniques of chemistry. Presentation is divided into volumetric, gravimetric and instrumental methods. Applications are to typical industrial materials. Prerequisite: CheT 1. *Lab* 8, *Cr* 4.

*4. **Elementary Chemical Engineering***—An introduction to the basics of chemical engineering. The physic-chemical principles underlying calculations are presented and their applications to processes are illustrated. Prerequisite: CheT 2. *Rec* 3, *Cr* 3.

*5. **Process Instrumentation*** — An introduction to principles and techniques used for measuring industrial process variables such as temperature, pressure, flow, etc., and an introduction to process control. Prerequisite: CheT 3. *Rec* 1, *Lab* 2, *Cr* 2.

*6. **Data Analysis I***—A course to familiarize the student with published sources of technical data and methods of analyzing and summarizing the data. Elementary statistics, graphical presentations, and report writing will be emphasized. *Rec* 2, *Cr* 2.

*7. **Chemical Processes***—An introduction to unit processes common to chemical process industries. Prerequisite: CheT 4. *Rec* 3, *Cr* 3.

*8. **Data Analysis II***—Continuing from Data Analysis I, a further study is made of statistics. Then, principles of designing experiments and optimizing results are discussed. The course concludes with instruction in Fortran programming and the use of computers for data analysis. Prerequisite: CheT 6. *Rec* 3, *Cr* 3.

PaT 1. Pulp Technology—A course on the manufacture of various kinds of wood pulp used in paper making. Wood as a raw material, the major pulping processes, and bleaching methods are discussed. Prerequisite: CheT 1 or concurrent. *Rec* 3, *Cr* 3.

PaT 2. Paper Technology—A course describing the processes for the manufacture of paper. Stock preparation, paper machines, surface finishing and quality control are described. Prerequisite: PaT 1. *Rec* 3, *Cr* 3.

PaT 3. Pulp and Paper Analysis—A laboratory course on the various physical and chemical tests to characterize pulp and paper. Prerequisites: PaT 1, PaT 2. *Lab* 12, *Cr* 6.

PaT 4. Pulp and Paper Processes — A laboratory course covering the unit operations in the making of pulp and paper. Prerequisite: PaT 3. *Lab* 8, *Cr* 4.

CIVIL ENGINEERING TECHNOLOGY

The curriculum is designed to provide the student with a basic grounding in the physical and mathematical sciences as preparation for his specialized studies in Civil Engineering Technology. These specialized studies are coordinated so as to prepare the graduate to assist as an aide to professional civil engineers in the areas of surveying, materials testing, highway engineering, construction engineering and structural engineering.

The emphasis in all the work is on the practical aspects of civil engineering design and construction. The program includes on-the-job summer training after the first year of study. Employment opportunities are excellent for the well-trained engineering technician in the construction field.

Civil Engineering Technology Curriculum

SEMESTER 1

		Subject	Rec	Lab	Cr
CeT	1	Plane Surveying	2	6	4
EgT	1	Technical Drawing	0	4	2
EhT	1	English Comp.	3	0	3
MsT	2	Basic Mathematics	3	0	3
Pe	1	Physical Education	0	2	0
PsT	7	Basic Physics	3	2	4
			11	14	16

SEMESTER 2

		Subject	Rec	Lab	Cr
CeT	2	Adv. & Geodetic Surveying	3	3	4
CeT	11	Structural Mech.	3	0	3
EgT	2	Technical Drawing	0	4	2
EhT	2	English Comp.	3	0	3
MsT	4	Basic Mathematics	3	0	3
Pe	2	Physical Education	0	2	0
EeT	30	Circuits, Machines & Electronics	4	3	5
			16	12	20

SUMMER INTERNSHIP REQUIRED WITH HIGHWAY DEPARTMENT OR CONTRACTOR OR CONSULTANT

SEMESTER 3

		Subject	Rec	Lab	Cr
2	Ab	Intro. to Economics	3	0	3
CeT	3	Hwy. & Bld. Surv.	2	3	3
CeT	12	Struct. Design	3	3	4
CeT	21	Material Props. & Testing	2	3	3
CeT	30	Hwy. Operations	3	4	5
			13	13	18

SEMESTER 4

		Subject	Rec	Lab	Cr
6	Ab	Dynamics of Human Behavior	3	0	3
CeT	13	Struct. Design	3	3	4
CeT	22	Material Props. & Testing	2	3	3
CeT	31	Const. Engineering	3	3	4
CeT	40	Civil Engr. Mgmt.	3	0	3
			14	9	17

Courses in Civil Engineering Technology (CeT)

1. Plane Surveying—Surveying instruments and their use in line measurement, leveling and traversing. Construction and drawing of plans, profiles, and topographic maps. *Rec* 2, *Lab* 6, *Cr* 4.

2. Advanced and Geodetic Surveying—Curves and earthwork computation and field layout. Property surveys and legal aspects. Astronomical observations, triangulation, and precise leveling using precision surveying instruments. Prerequisite: CeT 1. *Rec* 3, *Lab* 3, *Cr* 4.

3. Highway and Building Surveys—Computation and layout of buildings, bridges, pipelines, canals and highways for line and grade. Reconnaissance, location, construction, and final quantity surveys together with appropriate mapping are undertaken. *Rec* 2, *Lab* 3, *Cr* 3.

4. Elementary Surveying — The use of surveying instruments and the various methods used for plane surveying. Stadia and mapping work. Course is for forestry technology students only. Prerequisite: Ms T2 or equivalent. *Rec* 2, *Lab* 3, *Cr* 3.

11. Structural Mechanics—Analytical and graphical solutions of force systems. Load, shear, moment and deflection values are solved for in beams, trusses, and frames under static loading. Studies of stresses and strains that occur as structural members are subjected to shearing, tensile, compressive and flexural forces. *Rec* 3, *Cr* 3.

12/13. Structural Design—Application of structural analysis principles to the design of timber, steel, and concrete beams, trusses, and frames. Current design codes and practices are used. *Rec* 3, *Lab* 3, *Cr* 4.

20. Selected Topics in Civil Engineering Technology—Topics in Engineering Technology not regularly covered in other courses. The content is varied to suit individual needs. The course may be taken more than once. Prerequisite: consent of the instructor. *Cr Ar* 1-3 hr.

21/22. Material Properties and Testing—The study and testing of the properties of materials used in the construction of civil engineering work. Timber, steel, concrete, soil aggregates, and butiminous materials are tested. Their selection and application to specific purposes are emphasized. *Rec* 2, *Lab* 3, *Cr* 3.

30. Highway Operations—The fundamentals of highway, street and intersection design and layout are studied. Data collection methods relating to traffic volumes and distribution, traffic survey techniques, traffic operations in work areas and temporary routines are treated. Consideration of drainage requirements and pavement sufficiency studies related to highway design criteria. Administrative, right-of-way, maintenance and financing problems are discussed. *Rec* 3, *Lab* 4, *Cr* 5.

31. Construction Engineering—Studies of the use, performance and economics of light and heavy construction equipment. Performances and rates of production for various skilled labor trades. Field trips will be taken to study construction practices. *Rec* 3, *Lab* 3, *Cr* 4.

40. Civil Engineering Management—A study of office and field practice from beginning to end of the construction of a major civil engineering project. Contracts and specifications, labor relations, professional ethics and practice, accounting and reporting procedures, and legal aspects will be included. *Rec* 3, *Cr* 3.

ELECTRICAL ENGINEERING TECHNOLOGY

The purpose of this two-year program is to prepare the student for practical work in the application of electrical engineering principles to equipment and instrumentation. Graduates will find employment opportunities in all types of industry, in large firms as responsible assistants to electrical engineers, and in small firms whose electrical needs require more than the talents of an electrician or an electrical technician.

In the first semester the groundwork is laid in algebra and trigonometry, mechanics and d-c circuits. In the second semester a-c circuits and laboratory techniques are introduced in the electrical courses, and the beginning of calculus in the math course. Fundamentals of computer programming are also studied. The third semester includes the introduction of electronics and machine theory. In the fourth semester applications are treated in electronics, control, and instrumentation, and an opportunity for independent work is provided in a semester projects course. The program is rounded out with courses in English, speech, machine shop, and technical drawing.

Electrical Engineering Technology Curriculum

SEMESTER 1

		Subject	Rec	Lab or Comp	Cr	
Ee	T11	Basic Electricity	2	0	3	3
Eg	T1	Technical Drawing	0	0	4	2
Eh	T1	English Comp.	3	0	0	3
Me	T9	Machine Shop & Welding	1	0	4	3
Ms	T2	Basic Mathematics	3	0	0	3
Pe	1	Physical Education	0	0	2	0
Ps	T7	Basic Physics	3	0	3	4
			12	0	16	18

SEMESTER 2

		Subject	Rec	Lab or Comp	Cr	
Ee	T21	Basic Circuits	3	3	3	5
Ee	T22	Basic Methods of Tech. Computation	0	4	0	2
Eg	T2	Technical Drawing	0	0	4	2
Eh	T2	English Comp.	3	0	0	3
Ms	T4	Basic Mathematics	3	0	0	3
Pe	2	Physical Education	0	0	2	0
Sh	1	Fund. of Public Speaking	3	0	0	3
			12	7	9	18

SEMESTER 3

		Subject	Rec	Lab or Comp	Cr	
EeT	33	Electronics	3	3	3	5
EeT	34	Eng. Materials	3	0	0	3
EeT	35	Elec. Machinery	3	3	3	5
EeT	37	Tech. of Elec. Measurement	2	0	3	3
MsT	6	Basic Mathematics	3	0	0	3
			14	6	9	19

SEMESTER 4

		Subject	Rec	Lab or Comp	Cr	
Ee	T43	Applied Electronics	3	0	3	4
Ee	T45	Power Distribution, Illu. and Acoustics	3	0	3	4
Ee	T47	Elec. Instrumentation & Control	3	0	3	4
Ee	T48	Elec. Projects	0	0	6	2
		Non-Tech. Elective	3	0	0	3
			12	0	15	17

Courses in Electrical Engineering Technology (EeT)

11. Basic Electricity—A non-calculus introduction to elementary electric and magnetic concepts, d-c networks and network theorems, and magnetic circuits; including laboratory use of instruments for making d-c circuit measurements. Prerequisite: Ms T2 concurrent. *Rec* 2, *Comp or Lab* 3, *Cr* 3.

21. Basic Circuits—Continuation of EeT 11, constituting a non-calculus introduction to reactive elements, and continuing into the phasor analysis of single-phase and polyphase a-c circuits in the steady state. Prerequisite: Eet 11, MsT 4 concurrent. *Rec* 3, *Comp* 3, *Lab* 3, *Cr* 5.

22. Basic Methods of Technical Computation—Computations by use of the slide rule. Elements of digital computer programming and numerical analysis techniques. Prerequisite: MsT 4 concurrent. *Comp* 4, *Cr* 2.

30. Circuits, Machines, and Electronics—Electrical concepts and devices, elementary circuit analysis; fundamentals of AC and DC machinery; principles of electronic devices and circuits. Prerequisite: PsT 7. Prerequisite or corequisite: MsT 4. Fall: *Rec* 4, *Comp or Lab* 3, *Cr* 5, for mechanical engineering technicians. Spring: *Rec*. *Comp or Lab* 3, *Cr* 4, for civil and chemical engineering technicians.

33. Electronics—Basic physical principles of vacuum, gaseous, and solid state electronic devices. Analysis of rectification, amplification, feedback, and signal generation circuits. Load line analysis and equivalent circuits. Prerequisite: EeT 21. *Rec* 3, *Comp* 3, *Lab* 3, *Cr* 5.

34. Engineering Materials—Physical and electrical properties of materials used in electrical equipment and electronic devices. Emphasis on electrical insulation, semiconductor materials, and magnetic materials. *Rec* 3, *Cr* 3.

35. Electrical Machinery—Theory, performance characteristics and operational control of DC and AC machines. Prerequisite: EeT 21. *Rec* 3, *Comp* 3, *Lab* 3, *Cr* 5.

37. Techniques of Electrical Measurement—The theory and operation of both basic and sophisticated measuring devices and equipment. *Rec* 2, *Lab* 3, Cr 3.

43. Applied Electronics—Industrial and commercial electronic circuits and systems, emphasizing amplitude and frequency modulation, detection, radio and television transmitters and receivers, and digital circuits and computers. Prerequisite: EeT 33. *Rec* 3, *Lab* 3, *Cr* 4.

45. Power Distribution, Illumination and Acoustics—Distribution of electric power to lead centers, losses, voltage regulation, power factor correction. General illumination theory; elementary acoustic theory. Prerequisite: EeT 21. *Rec* 3, *Comp* 4 *or Lab* 3, *Cr* 4.

47. Electrical Instrumentation and Control—A study of controllers used for AC and DC motors; the use of selsyn devices, magnetic amplifiers, amplidynes, silicon controlled rectifiers and photo-electric devices in control systems. Prerequisite: EeT 35. *Rec* 3, *Lab* 3, *Cr* 4.

48. Electrical Projects—The student will design, build and test a specific piece of equipment such as an amplifier, voltage regulator, or a piece of test equipment. *Lab* 6, *Cr* 2.

MECHANICAL ENGINEERING TECHNOLOGY

The field of mechanical engineering technology includes environmental control, mechanical design, manufacturing processes, heat power and internal combustion engines, and the many technical activities associated with them. The two-year program prepares its graduates for a variety of opportunities as engineering technicians in engineering departments, manufacturing operations and the mechanical service industries.

The curriculum provides a well-rounded education in mechanical engineering technology. Classroom instruction in the various subjects is supplemented by extensive training in their practical application in the laboratory and shop.

Students are urged to take technical or industrial employment during the summer between the two years.

The curriculum shown is a transition program. Currently enrolled students will complete Semester 3 and 4 shown. Students entering in the fall of 1969 will follow Semester 1 and 2.

SEMESTER 1

		Subject	Rec	Lab	Cr
CheT	1	Chemical Science	3	0	3
GeT	1	Technical Drawing	0	4	2
EhT	1	English Comp.	3	0	3
MeT	7	Mach. Tool Lab.	1	4	3
MeT	1	Orientation	1	0	0
MsT	2	Math I	3	0	3
Pe	1	Phys. Ed.	0	2	0
PsT	7	Basic Physics	3	2	4
			14	12	18

SEMESTER 2

		Subject	Rec	Lab	Cr
2	Are	Intro. to Econ.	3	0	3
GeT	2	Technical Drawing	0	4	2
EhT	2	English Comp.	3	0	3
MeT	8	Mach. Tool Lab.	1	3	2
MeT	50	Statics & Kinematics	4	0	4
MsT	4	Math II	3	0	3
Pe	2	Phys. Ed.	0	2	0
			14	9	17

SEMESTER 3

		Subject	Rec	Lab	Cr
EeT	30	Circuits, Machines and Electronics for M. E. Technicians	4	3	5
GeT	3	Machine Drawing	0	4	2
MeT	11	Machine Tool Lab.	0	3	1
MeT	17	Dynamics	2	0	2
MeT	19	Strength of Materials	3	2	4
MeT	25	Fluid Mechanics	3	2	4
			12	14	18

SEMESTER 4

		Subject	Rec	Lab	Cr
2	Are	Intro. to Economics	3	0	3
MeT	34	Mech. Tech. Lab.	1	4	3
MeT	36	Heating, Air Cond. & Refrig.	3	2	4
MeT	61	Mach. Des. & Tool Des.	2	4	4
MeT	70	Metal Product Manufacturing Tech.	3	3	4
			12	13	18

Courses in Mechanical Engineering Technology (MeT)

*1. **Orientation***—A series of meetings involving lectures, discussions, guest speakers and audio-visual aids. The purpose of the course is to inform students entering mechanical engineering technology about the field and opportunities in it. *Cr* 0.

*5. **Heat Treatment***—Modern non-ferrous metal heat treating operations and the basic principles underlying them. Analysis of the effects of thermal and mechanical operations on microstructure and attendant mechanical properties. *Rec* 1, *Lab* 2, *Cr* 2.

*7. **Machine Tool Laboratory***—Theory and application of fundamental metal removing processes. Basic metrology and tool nomenclature. *Rec* 1, *Lab* 4, *Cr* 3.

*8. **Machine Tool Laboratory***—Class projects, machine repair and maintenance, interdepartmental cooperation on student projects and advanced machine tool operation and set-up. Oxacetylene welding and electric arc welding. Prerequisite: MeT 7. *Rec* 1, *Lab* 3, *Cr* 2.

*9. **Machine Shop and Welding for Electrical Engineering Technicians***—Fundamental bench work and light machine work using drill presses, lathes,

milling machines, shapers and surface grinders. Familiarization with and use of oxyacetylene and electric arc welding equipment. *Rec* 1, *Lab* 4, *Cr* 3.

11. Machine Tool Laboratory—Design and manufacture of prototype assembly in conjunction with GeT 3. Application of skill and theory in supervising group projects. Construction and use of production tooling set-ups. Advanced metrology. Prerequisite: MeT 8. *Lab* 3, *Cr* 1.

17. Dynamics—Kinetics of particles; translation, rotation and plane motion of rigid bodies; work and energy impulse and momentum. Prerequisite: MeT 50. *Rec* 2, *Cr* 2.

19. Strength of Materials—Stress and strain in materials and bodies subject to tension, compression, torsion, and flexure. Beam theory; deflection in prismatic members; columns; combined stresses. Prerequisite: MeT 50. *Rec* 3, *Lab* 2, *Cr* 4.

25. Fluid Mechanics—Fluid statics, kinematics, Bernoulli equation, momentum, viscosity, pipe and conduit flow, and an introduction to compressible flow. Prerequisite: MsT 4, PsT 7. *Rec* 3, *Lab* 2, *Cr* 4.

33. Mechanical Technology—Elementary thermodynamics, mechanical apparatus, power plant equipment. Engineering calculations relative to heat, power, work and mechanical and electrical energy. Prerequisite: PsT 7. *Rec* 3, *Cr* 3.

34. Mechanical Technology Laboratory—Experimental applications of solid and fluid mechanics, thermodynamics, and metallurgy. Introduction to digital computer programming.

36. Heating, Air Conditioning, and Refrigeration—Heat transmission and properties of air. Heating systems, ventilation requirements and design. Refrigeration cycles, refrigerant properties, load calculations for summer air conditioning and industrial refrigeration. Refrigeration equipment and controls. Prerequisite: MeT 33, *Rec* 3, *Lab* 2, *Cr* 4.

37. Internal Combustion Engines—Thermodynamics of engine cycles, design and operation of steam and internal combustion engines, steam and gas turbines and jet engines. Fuels and combustion, and injection, efficiencies, detonation and knock testing, cooling and lubrication. *Rec* 3, *Lab* 2, *Cr* 4.

50. Statics and Kinematics—The study of forces and rigid bodies in equilibrium, properties of area and masses. The analysis of motion: linkages, cams, gear teeth and gear trains. Prerequisite: PsT 7. *Rec* 4, *Cr* 4.

61. Machine Design and Tool Design—The design of machine elements, theories of failure, fatigue and stress concentration. Design of jigs, fixtures, special tools and their relation to manufacturing methods and production efficiency. *Rec* 2, *Lab* 4, *Cr* 4.

70. Metal Product Manufacturing Technology—A presentation of production processes and problems to include: process planning, automation, numerical control, quality analysis, quality control, specialized machine tools and current advances in the field of metal working. Completion of prototype assembly and evaluation of same. *Rec* 3, *Lab* 3, *Cr* 4.

Service Courses for the Technical Institute Division

EhT 1. English Composition—A review of grammar and the principles of effective expression for the purpose of direct application in written reports of practical value. *Rec* 3, *Cr* 3.

EhT 2. English Composition—A continuation of EhT 1 with particular emphasis given to expository writing. *Rec* 3, *Cr* 3.

GeT 1/2. Technical Drawing—Exercises in instrumental drawing, multiview drawing, freehand technical sketching, and lettering. Course 2 introduces instrumental pictorial drawing, threads and fasteners, and working drawings. *Lab* 4, *Cr* 2.

GeT 3. Machine Drawing—Analysis of space relationships with matching applied problems. Practical design problems utilizing various engineering materials. Preparation of complete working drawings. Prerequisite: EgT 2. *Lab* 4, *Cr* 2.

MsT 2. Mathematics I—Algebra and trigonometry, including numbers, functions, graphs, factoring and fractions, exponents and radicals, logarithms, linear equations, quadratic functions, equations of higher degree and solutions of triangles. *Rec* 3, *Cr* 3.

MsT 4. Mathematics II—Elements of analytic geometry and introductory calculus, including straight lines, conic sections, polar coordinates, an introduction to the derivative and its applications. *Rec* 3, *Cr* 3.

MsT 6. Mathematics III—Further topics in the calculus, including an introduction to integration, derivatives of transcendental functions and techniques of integration. *Rec* 3, *Cr* 3.

PsT 7. Basic Physics—An introduction to the basic concepts of mechanics, sound and heat with illustrations taken from technical applications. Calculus is not used. Lec with *Dem* 1, *Rec* 2, *Cr* 4.


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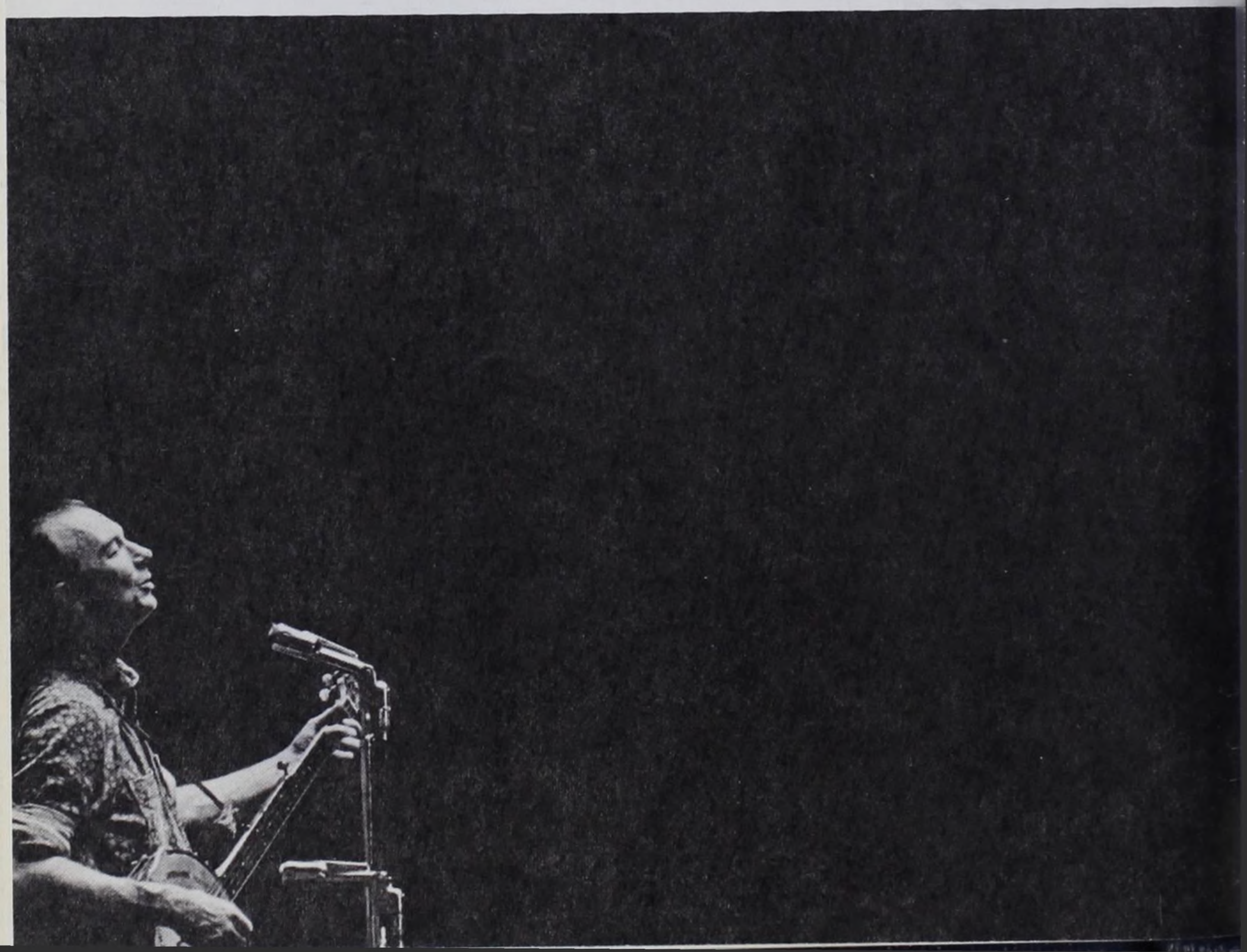


UNIVERSITY OF MAINE IN AUGUSTA

LLOYD J. JEWETT, DIRECTOR

University of Maine, Augusta

The University of Maine, Augusta is located in the state's capital city on 99 Western Avenue. The city offers a wide variety of educational, professional, and recreational opportunities. The UMA buildings are located a short distance from Interstate 95 on the west and the State House on the east.

ACADEMIC PROGRAM

The University of Maine, Augusta was organized to serve commuting students. Currently three associate degree programs are being offered: (1) Liberal Studies, (a University-Parallel Curriculum) (2) Administration, and (3) General Education.

The objective of the Liberal Studies program is to give the student maximum opportunity to explore various academic areas. Two years of instruction in the arts and sciences are provided for students interested in earning bachelor's degrees and in preparing for those professions for which four or more years of college study are necessary.

The objectives of the Administration program (Business and Public) are to provide a combined program of liberal arts and career training and to provide a two-year, semi-professional terminal program.

The objective of the General Education program is to provide a two-year college education for students who for reasons of choice, preparation, or ability do not enter traditional baccalaureate programs. Also, it is to develop an attitude of intellectual curiosity and an appreciation of education as a continuing process.

THE CONTINUING EDUCATION DIVISION

Approximately 225 graduate and undergraduate credit courses will be offered this year through this program. For information regarding courses and programs offered at UMA contact the Center Director of Continuing Education, 99 Western Avenue, Augusta, Maine, 04330.

UNIVERSITY POLICY ON HOUSING

The University of Maine, Augusta is a commuter campus. In instances where students, with the approval of their parents, decide to obtain student apartments or rooms, the University of Maine, Augusta will not assume any responsibility

1969-70 CALENDAR

Fall 1969		1969
Freshman Orientation	Thursday, Friday	Aug. 28, 29
Registration of all students who have not previously completed it by mail	Sat., 8:00-12:00 M 1:00- 4:30 p.m.	Aug. 30
Classes begin	Wed., 8:00 a.m.	Sept. 3
Midsemester reports due (covering the first half semester to October 29)	Fri., 12:00 M	Nov. 7
Thanksgiving Recess begins	Tues., 5:20 p.m.	Nov 25
Classes resume	Mon., 8:00 a.m.	Dec. 1
Classes end	Fri., 5:20 p.m.	Dec. 12
Final examination begin	Mon., 8:00 a.m.	Dec. 15
Registration for spring semester	Monday-Saturday	Dec. 15-20
Final examinations end	Sat., 4:00 p.m.	Dec. 20
Midyear recess begins	Sat., 4:00 p.m.	Dec. 20
Registration of all students who have not previously completed it	Sat., 4:00 p.m.	Dec. 20
Commencement exercises	Sat., 7:45 p.m.	Jan. 24
Spring 1970		**1970**
Classes begin	Mon., 8:00 a.m.	Feb. 2
Midsemester reports due (covering the first half semester to March 25)	Thurs., 12:00 M	Mar. 26
Spring recess begins	Fri., 5:20 p.m.	Mar. 27
Classes resume	Mon., 8:00 a.m.	Apr. 6
Maine Day	Wednesday	May 6
Classes end	Mon., 5:20 p.m.	May 18
Reading Day	Tuesday	May 19
Final examinations begin	Wed., 8:00 a.m.	May 20
Final examinations end	Tues., 4:00 p.m.	May 26
Class Day (tentative)	Thursday	May 28
Commencement exercises (tentative)	Friday	May 29

with respect to locating or recommending facilities, resolving problems arising between tenants and landlords, or providing supervision over the use of such facilities. Students in this category, however, may be subject to University disciplinary action if their conduct reflects adversely upon themselves or the University.

BOOK STORE

A branch of the University Stores is located at UMA at the Pike Street entrance. All required textbooks, supplemental materials, a wide selection of college-level paperbacks, as well as many other items of interest to the college student are available. The store is open to the public.

ADMISSIONS

Application for admission and all inquiries concerning admission to UMA should be addressed to the Admissions Office, Wingate Hall, Orono, Maine, 04473. Application blanks should be completed and returned promptly, accompanied by the application fee of $10 which cannot be refunded.

The student expenses outlined below are the anticipated charges for 1969-70. Changing costs may require and adjustment of these charges.

Regular Student's Tuition per semester	$200
Regular Student's Tuition per year	$400
Special Student's Tuition for each semester hour	$ 22

Special Fees—A fee of $10 is required with the application for admission and this fee cannot be refunded. A fee of $10 is charged for late registration. Each student provides his own books and supplies. The annual cost is approximately $100. All students pay a $6 fee in the fall semester to support campus student activities.

Payment of Bills—Charges for tuition are due and payable on or before registration day for each semester. Full tuition will be charged for 10 or more semester hours.

Installment Program—Students whose circumstances are such that payment of their semester bills in full at the time of registration would work a real hardship will be permitted to use the following schedule:

Fall Semester

1/2 the total semester charge at registration
1/6 the total semester charge on October 1
1/6 the total semester charge on November 1
1/6 the total semester charge on December 1

Spring Semester

1/2 the total semester charge at registration
1/6 the total semester charge on March 1
1/6 the total semester charge on April 1
1/6 the total semester charge on May 1

For the 1969-70 academic year no extra assessment will be made to students using the above deferment schedule, but if it is found that too many take advantage of its provisions it will become necessary in the future to make a service charge for its use.

Refunds—Students leaving the University before the end of a semester, if they are using the installment program, are not entitled to a refund of tuition because the timing of the payments is correlated with the charges. Those who have prepaid their semester charges will be refunded the money they have prepaid in excess of the amounts specified by the installment program.

HEALTH AND MEDICAL CARE

In lieu of the medical assistance provided at other campuses by the Student Health Center, the University has arranged to pay the cost of the accident coverage, without charge, for each full-time student. Coverage applicable to sickness is also available, on a voluntary basis, at an annual cost of $21.50. Further information may be obtained at the Office of Student Affairs.

PHYSICAL EXAMINATIONS

At the time of registration each student must present a report showing he has had a physical examination, preferably by the family physician. These reports are made on forms furnished by the University. A physical examination may be required of any student at any time during his attendance at the college.

Each year, through the cooperation of the Maine Department of Health and Welfare, chest X-rays are made available to all students without charge.

HONORS PROGRAM

The University of Maine, Augusta Honors Program is open to interested students. Its purpose is two-fold:

1) To introduce students to the major areas of knowledge—mathematics and science, social studies, literature, philosophy, and the fine arts—through individual reading and group discussions;
2) To develop their skills to as high a degree as possible in the field in which they choose to concentrate.

STUDENT ACTIVITIES

Students at UMA have a wide variety of activities in which to participate such as the Student Assembly and several clubs. There are club activities in basketball, tennis, rifle marksmanship, golf, fencing, and sailing. The intramural program is tailored for maximum participation in basketball, badminton, softball, and volleyball. Cultural films, lectures, and musical programs are made available to the student at little or no cost.

GUIDANCE AND TUTORIAL PROGRAMS

Every effort is made to provide adequate academic and personal counseling for all students, with the aim of enabling them to successfully complete their courses of study. Faculty advisers are assigned to each student to assist him in planning his program.

Tutorial instruction is available for those students who need extra help in English, mathematics, and reading.

STUDENT REGULATIONS

It is assumed that all students admitted to the University of Maine, Augusta are willing to subscribe to the following: The University expects from every student respect for order, morality, and the rights of others, and such sense of personal honor as is demanded of good citizens. It reserves the right to dismiss any student whose conduct or academic standing is regarded by the administration and faculty to be unsatisfactory.

COURSES OF INSTRUCTION OFFERED AT AUGUSTA

When a dash is used between the two numbers (e.g., 1-2), both semesters must be taken to obtain credit; when a slant is used (e.g., 1/2), the first semester may be taken by itself, but the second cannot be taken unless the first is taken previously; when a period is used (e.g., 1.2), either semester may be taken for credit.

TWO-YEAR PROGRAM IN LIBERAL STUDIES (ALS)

(A University Parallel Curriculum)

Objectives—The objectives of the Liberal Studies program are: (1) to offer two years of collegiate education acceptable for transfer to four-year colleges and universities, (2) to provide two years of liberal education.

The program of study is planned to give the student maximum opportunity to

explore various academic areas. Two years of instruction in the arts and sciences are provided for students interested in earning bachelor's degrees and in preparing for those professions for which four or more years of college study are necessary.

Upon successful completion of this program (60 credit hours at a minimum quality point average of 1.8) the student will be awarded an Associate of Arts degree in Liberal Studies.

Transfer—Upon completion of a given semester, a student may transfer to an appropriate baccalaureate degree program at the Orono or Portland campuses.

CORE REQUIREMENTS

		Degree Hours
1.	Mathematics	6
2.	Communications and Freshman Composition	6
3.	Natural Sciences	8
4.	Social Sciences	6
5.	Humanities (to include Man's Cultural Heritage)	6
*6.	Electives	28
	Total	60

*In the selection of electives the student should refer to program requirements of the college from which he intends to receive his baccalaureate degree.

SPECIFIC PROGRAM REQUIREMENTS

A. Students continuing in the College of Arts and Sciences:

1. **Foreign Language.** All students are required to complete a foreign language through the intermediate level or to pass a qualifying test.
2. **Social Science.** A minimum of two year-courses in social science are required of all students. Students who have not completed a basic one-year high school course in American History are required to take United States History.
3. **Natural Sciences.** A minimum of two years of work in science is required of all students. One year of this work must be a basic year-course in laboratory science or mathematics, and work of the second year must be taken in a different subject matter area. Two of the semester courses in descriptive science may be used to satisfy one year of this requirement.

B. Students continuing in the College of Life Sciences and Agriculture:

This plan should include the equivalent of one year-course in college biology and one year-course in freshman chemistry.

C. Students continuing in the College of Business Administration:

This plan should include a one year-course in Principles of Accounting and a one year-course in Principles of Economics.

D. Students continuing in the College of Education:

This plan should include a one year-course in psychology. Students planning to major in Elementary Education should fulfill their math requirement by taking Ms 107 and Ms 108.

E. Students continuing in the College of Technology:

Students should plan to transfer at the end of the freshman year. The freshman year program should include:

1. One year-course in freshman Chemistry.
2. One year-course in Engineering Drawing.
3. One year-course in Mathematics—equivalent to Ms 12—Ms 27.
4. One year-course in Physics—equivalent to Ps 1—Ps 2.

COURSE OFFERINGS

Program requirements are selected from the following:

Communications and Literature

Co	10	Communications
Cp	11.12	Western Tradition in Literature
Cp	91.92	20th Century Drama of The Western World
Eh	1	Freshman Composition
Eh	9.10	Modern Literature
Eh	21	English Literature from Beowulf to Spenser
Eh	22	English Literature from Spenser to Samuel Johnson
Eh	23	English Literature from Johnson to the Victorians
Eh	24	English Literature from the Pre-Raphaelites to the Present
Eh	43.44	American Literature
Eh	47	The American Short Story
Ed	53/54	Romanticism and Revolt

Foreign Languages and Classics

Fr	1-2	Elementary French
Fr	3/4	Intermediate French
Ru	1-2	Elementary Russian
Ru	3/4	Intermediate Russian
Cl	3.4	Greek and Latin Literature in Translation

Natural Sciences and Mathematics

As	9	Descriptive Astronomy
Bio	1/2	Introduction to Biology
By	21	Introduction to Bacteriology
Gy	1/2	Physical and Historical Geology
Ms	2	Elementary Functions and Analytic Geometry
Ms	5/6	Elements of College Mathematics
Ms	12	Analytic Geometry and Calculus
Ms	19	Principles of Statistical Inference
Ms	27	Analytic Geometry and Calculus
Ms	28	Analytic Geometry and Calculus
Ms	29	Differential Equations
Ms	107/108	Structure of Arithmetic

Humanities

At	5.6	Art Appreciation and History
Hr	47.48	Honors Gr. Tutorial
Hu	1	Man's Cultural Heritage
Hy	1.2	Classical and Medieval Civilization
Pl	1.2	Philosophy and Mod. Life
Pl	70	Perspectives in Culture
Pl	16	Philosophy of Religion
Pl	36/37	Logic (I, II)
Pl	59	Contemporary Philosophy

Social Sciences			Electives		
Ay	1/2	Introduction to Anthropology	At	1/2	Basic Drawing
Ec	1/2	Principles of Economics	At	7/8	Basic Design
Ec	37	Comparative Economic Systems	At	9/10	Advanced Design
			At	11/12	Advanced Drawing
Ec	38	Economic Development	At	13.14	Fundamentals of Painting
Ge	23/24	Political Geography	At	17/18	Enameling
Hy	3.4	United States History	At	61.62	Modern Painting
Hy	5.6	History of Western Europe	Ba	9/10	Principles of Accounting I, II
Pol	1/2	Introduction to Government	Ed	B 2	The American School
Pol	21.22	Current World Problems	Ed	B 3	Growth Learning Process
Py	1/2	General Psychology	Mc	L 1	Understanding Music
Sy	3/4	Introduction to Sociology	Mc	T 1	Fundamentals of Music

TWO-YEAR LIBERAL STUDIES COURSE DESCRIPTIONS

Art

At 1/2. Basic Drawing—Fundamentals of drawing. Principles of perspective, shades and shadows, and composition. Pencil, charcoal, graphite, and crayon. *Lab* 4, *Cr* 2.

At 5. 6. Art Appreciation and History—Techniques and trends to architecture, sculpture, and painting as related to the history of art from the earliest times to the present day. Lectures, text, slides, and prints. *Rec* 3, *Cr* 3.

At 7/8. Basic Design—Fundamentals of design through crafts experience. Block printing, silk screening, clay molding, plastic casting, papier mache, posters, wire sculpture. Two and three dimensional design problems. *Lab* 4, *Cr* 2. (Laboratory fee $5)

At 9/10. Advanced Design—Advanced work in design problems using crafts experiences introduced in basic course. Two and three dimensional problems carried into layout, graphics, fabrics, etc. Prerequisite: At 1/2 or At 7/8, *Lab* 4, *Cr* 2. (Laboratory fee $5)

At 11/12. Advanced Drawing—Advanced studies in form, space, composition, and cast drawing. Field trips for outdoor sketching and painting. Development from charcoal to water color painting. Prerequisite: At 1/2. *Lab* 4, *Cr* 2.

At 13. 14. Fundamentals of Painting—Basic introductions to the painting art. Exercises in color, technique, and composition. Studio and outdoor subjects. All media. Prerequisite: At 1/2 or permission. (Not open to art majors) *Lab* 4, *Cr* 2.

At 17/18. Enameling — An introduction to the various approaches of enameling as follows: Limoges Cloisonne, Champleve and Baille-Taille. Prerequisite: At 1/2 or At 7/8. *Rec* 1, *Lab* 3, *Cr* 3. (Laboratory fee $5)

At 61. 62. Modern Painting — A survey of 19th and 20th century painting (in seminar form). A survey covering the period of art from the revolutionists of the 19th century to the present day abstractionists and hard-edge painters. Lectures with slides plus individual research and reports. *Rec* 3, *Cr* 3. (At 5.6 recommended but not required.)

Business and Economics

Ba 9. Principles of Accounting I—An introductory course in accounting. Emphasis on the basic accounting cycle, management use of accounting data,

construction and analysis of financial statements, asset valuation, and elementary cost analysis. *Cr* 3.

Ba 10. Principles of Accounting II—Books of original entry, analysis of assets and liabilities, negotiable instruments, and an introduction to partnership and corporation accounting. Prerequisite: Ba 9. *Cr* 3.

Ec 1/2. Principles of Economics—Analysis of the fundamentals, characteristics, and institutions of modern economic society, including business and labor organizations, national and international policies, *Cr* 3.

Ec 37. Comparative Economic Systems—The structures and operating principles of the major contemporary economic systems are examined and compared. Prerequisite: Ec 1/2. *Cr* 3.

Ec 38. Economic Development—The theories and practices of interregional and international economic development. Special attention is given to development problems of emerging nations. Prerequisite: Ec 1/2. *Cr* 3.

Communications and Literature

Co 10. Communications—To develop the ability to select, organize, and deliver an effective speech. In addition, the practice of extemporaneous speaking will be stressed. Consideration will be given to the choice of subject, selection and arrangement of material, audience analysis and delivery. Classroom experience in the preparation and delivery of short speeches. *Cr* 3.

Eh 1. Freshman Composition—Expository and narrative writing with the reading of illustrative material. *Cr* 3.

Eh 21. English Literature from Beowulf to Spenser—A chronological study of the foundation periods of English literature with emphasis on the major figures and some attention to the historical background. Readings, lectures, class discussions, and papers. *Cr* 3.

Eh 22. English Literature from Spenser to Samuel Johnson—A chronological study of the post-Renaissance, neo-classic and Augustan periods of English literature with emphasis on the major figures and some attention to the historical background and intellectual currents of the times. Readings, lectures, class discussions, and papers. *Cr* 3.

Eh 23. English Literature from Johnson to the Victorians—A chronological study of late 18th century and early 19th century English literature, with emphasis on the major figures and some attention to the historical background and intellectual currents of the times. Readings, lectures, class discussions and papers. *Cr* 3.

Eh 24. English Literature from the Pre-Raphaelites to the Present—A chronological study of English literature of the late 19th century and the first half of the 20th, with emphasis on the major figures and some attention to the historical background and intellectual currents of the times. Readings, lectures, class discussions, and papers. *Cr* 3.

Eh 43. 44. Survey of American Literature—Semester I—American literature from colonial times to the American Renaissance; Semester 2—American literature from the Rise of Realism to the present. *Cr* 3.

Eh 47. The American Short Story: Sources, Forms, Deveolpment—The American short story examined in terms of sources and form from its

beginnings to the present. Emphasis will be on the development and achievements of the short story as a major American contribution to world literature. Prerequisite: Eh 1. *Cr* 3.

Eh 53/54. Romanticism and Revolt—An investigation, primarily through literature, of that response to life termed "romantic" as distinguished from the "classic". The characteristics of "Romanticism" examined as they relate to revolt in human society. Other art forms, e.g. art and music, will be utilized to fully illustrate the characteristics of "Romanticism". *Cr* 3.

Cp 11. 12. The Western Tradition in Literature—A general survey of the major writers in the western literary tradition, with particular attention to the development of our cultural heritage and the evolution of major literary forms, first semester: Homer to the Renaissance; second semester: the 17th, 18th, and 19th centuries. *Cr* 3.

Cp 91. Early Twentieth Century Drama of the Western World—Major dramas of Ibsen, Strindberg, Pirandello, Shaw, O'Neill, and Maxwell Anderson. *Cr* 3.

Cp 92. Recent Twentieth Century Drama of the Western World—Major dramas of Brecht, Anouilh, Giraudoux, Williams, Miller, and Albee; and the Theatre of the Absurd, with Beckett, Ionesco, Genet, Pinter, etc. *Cr* 3.

Education

Ed B 2. The American School—Examines the nature, role, purposes, and curriculum of elementary and secondary schools. Special attention to the place and function of the teacher within this social institution. This is one of the courses prerequisite to student teaching in all regular undergraduate programs. Not open to freshmen. *Cr* 3.

Ed B 3. Growth-Learning Process—The pupil and his learning processes, including learning theories, pupil growth patterns, and selected techniques for the study of pupil development. This is one of the courses prerequisite to student teaching in all regular undergraduate programs. *Cr* 3.

Foreign Languages and Classics

Cl 3. 4. Greek and Latin Literature in Translation — A conspectus of Greek and Latin literature in translation. Major poetry, drama and prose will be read against important background readings in other fields. *Cr* 3.

Fr 1-2. Elementary French—Emphasis on development of listening comprehension, speaking, reading, and writing skills. Laboratory practice. For students who have had no French or less than two years of high school French. *Cr* 3.

Fr 3/4. Intermediate French—Continuation of 1-2. Laboratory practice. For students who have completed French 1-2 or who have completed two or three years of high school French. *Cr* 3.

Ru 1-2. Elementary Russian — Emphasis on development of listening comprehension, speaking, reading, and writing skills. Laboratory practice. *Cr* 3.

Ru 3/4. Intermediate Russian—Continuation of 1-2. Laboratory practice. This course fulfills the language generalization requirement. *Cr* 3.

History

Hy 1. 2. Classical and Medieval Civilization—The social and cultural development of the ancient Greeks and Romans is treated in the first semester. The second semester deals with the social and cultural development of Western Europe in the Middle Ages. Particular attention is given to the great achievements in literature, philosophy, religion, and art. *Cr* 3.

Hy 3. 4. United States History—From 1789 to recent years. The development of democracy, growth of the West, slavery and sectionalism, the Civil War, Reconstruction, the making of modern America, industrialization, imperialism, and other topics. *Cr* 3.

Hy 5. 6. History of Western Europe—Europe and its civilization from the decline of the Roman empire to the present. The emphasis is upon the development of those political, economic, and social institutions which help to explain our present-day civilization. *Cr* 3.

Honors Program

Hr 31. 32. Independent Studies Seminar—The purpose of this seminar is to develop a close student-faculty interchange of ideas and to encourage a student to undertake as much independent study as possible. In this form of study there develops an intimacy and an immediacy impossible to achieve in any other way. The student will be given an extensive list of subjects and may select three in order of priority. Whenever possible the courses selected will be assigned. *Cr* to be arranged.

Hr 47. 48. Honors Group Tutorial—Oral and written reports under tutorial direction, upon a planned sequence of books representative of the various fields of liberal education. Hr 47.48 fulfills the sophomore humanities requirements for those students registered in the Honors Program.

Humanities

Hu 1. Man's Cultural Heritage—A course to acquaint the beginning students with the major aspects of our cultural heritage, with emphasis on their inter-relationships and interdependence. Stress will be placed upon those ideas and accomplishments generally held to be of lasting significance in man's cultural evolution. Man's beginnings through the Renaissance. Required of all freshmen. *Cr* 3.

Mathematics and Astronomy

As 9. Descriptive Astronomy—An elementary course emphasizing the principles of this natural science. Lectures are supplemented by demonstrations in the planetarium and the observatory. *Cr* 3.

Ms 2. Elementary Functions and Analytic Geometry—A study of the polynomial, logarithmic, exponential, and trigonometric functions: equations, inequalities, cartesian and polar coordinate systems, and analytic geometry. The interplay of algebra and geometry along with the unifying role of the function is emphasized. Prerequisite: two years high school algebra. *Cr* 3.

Ms 5/6. Elements of College Mathematics—Modern viewpoint on certain basic mathematical material. Intended primarily for non-mathematics majors. *Cr* 3.

Ms 12. Analytic Geometry and Calculus—Equations and graphs, differentiation and integration of polynomials, applications. Prerequisite: trigonometry and equivalent of Ms 3. *Cr* 4.

Ms 19. Principles of Statistical Inference—An introductory course including such topics as distributions sampling variability, estimation, hypothesis testing and regression. *Cr* 3.

Ms 27. Analytic Geometry and Calculus—Conic sections; differentiation and integration of algebraic, trigonometric, logarithmic and exponential functions; applications. Prerequisite: Ms 12 or consent of the department. *Cr* 4.

Ms 28. Analytic Geometry and Calculus—Polar coordinates, geometry of three dimensions, infinite series, partial derivatives; multiple integrals; applications. Prerequisite: Ms 27. *Cr* 4.

Ms 29. Differential Equations—An introduction to ordinary differential equations; applications. Prerequisite: Ms 28. *Cr* 4.

Ms 107/108. The Structure of Arithmetic—A development of the real number system beginning with the sub-system of natural numbers and generalizing through the systems of integers, rational numbers, and real numbers. Properties of numbers, relations, and operations. Details of numeration systems. Primarily for the elementary school teacher. *Cr* 3.

Music

Mc L 1. Understanding Music—A study of the basic elements of music necessary for intelligent listening, with emphasis on the various historical movements, together with a study of the great composers and their contrasting styles as exemplified by their most important compositions. For the general student. *Cr* 3.

Mc T 1. Fundamentals of Music—Notation and terminology, scales and intervals, chords, ear training, elementary rhythmic and melodic dictation, sight-singing. Open to all students. Required of music majors at no credit for those failing to pass the Music Fundamentals Test. *Cr* 3.

Philosophy

Pl 1. 2. Philosophy and Modern Life—An introduction to philosophical thinking through an examination of contemporary spokesmen on ethics, religion, education, and politics and a critical comparison of their ideas with those major philosophers of the Western tradition. Representative topics are: classic and contemporary views of social justice; egoism and unselfishness; tradition and the formation of the present. Primarily for freshmen and sophomores. *Cr* 3.

Pl 16. Philosophy of Religion—Analysis of the nature of religious experience, knowledge, and language. Special attention is given to fundamental problems, classical and contemporary, exhibited in religious experience and pertaining to areas of common concern in the sciences, the humanities, and philosophy. Sophomore standing or consent of instructor. *Cr* 3.

Pl 36/37. Logic (I, II)—An introductory two-semester course in modern symbolic logic. Techniques of deductive inference, including decision pro-

cedures, contemporary syllogistic, and metalogic. Prerequisite for Pl 136: sophomore standing or instructor's consent. Prerequisite for Pl 137: Pl 136 or instructor's consent. *Cr* 3.

Pl 59. Contemporary Philosophy—A study of the origins, development, types, and basic tenets of some dominant contemporary trends such as: existenialism, phenomenology, the British analytic philosophy, and various philosophies of being. Prerequisite: Pl 1 or consent of the instructor.

Pl 70. Perspectives in Culture—The interrelations of the sciences and the arts in contemporary culture. *Cr* 3.

Political Science

Ge 23/24. Political Geography—The geographic and demographic factors that condition national and international politics. Emphasis on the relationships of the major nations to their areas and to the world, examination of their strategic necessities, and historical reviews of their resultant foreign policies. *Cr* 3.

Pol 1/2. Introduction to Government—The first semester includes the development and nature of the state, theories and types of government, constitutionalism, the nature, structure and control of political power, freedom and order, and the modern state in international relations. The second semester emphasizes the structure, practices and problems of American national government. *Cr* 3.

Pol 21. 22. Current World Problems—A study of contemporary national and international affairs based on area studies of the United States, the Soviet Union, Europe, the Middle East, the Far East, and Southeast Asia. Open to all students. *Cr* 2.

Pol 35. Democratic Governments of Europe—The political traditions, parties, governmental structures, and special political problems of Great Britain, France, and West Germany. Prerequisite: Pol 1/2. *Cr* 3.

Pol 36. Communist Government—Marxism-Leninism and the contemporary Communist party, state, economy and society of the Soviet Union. Survey of the satellites. Prerequisite: Pol 1/2. *Cr* 3.

Psychology

Py 1/2. General Psychology—Survey of psychology as the science of behavior. Lecture and discussion of major areas such as motivation, personality, intelligence, learning, etc. In order to provide greater depth to the course, all students are expected to participate in research projects to a maximum of two hours. Not open to freshmen. *Cr* 3.

Natural Sciences

Bio 1/2. General Biology—A study of the organization of the plant and animal body, including that of man. Emphasis on protoplasm, the cell, tissues, organs, and systems. It will include a survey of the basic processes of growth and development, the maintenance of life, the origin and evolution of organisms and the multiple relationships of living things as they exist in the complex world of today. *Lec* 3, *Lab* 4, *Cr* 4.

By 21. Introduction to Bacteriology—The basic principles of bacteriology and their application to agriculture, industry, sanitation, public health and disease. A descriptive and demonstration course for non-technical students. *Rec* 3, *Cr* 3.

Gy 1 (1a). Physical Geology—A study of earth materials and processes, volcanism, mountain building, the work of seas, streams, ice and winds. Laboratory work includes an elementary consideration of minerals, rocks and maps. One-day field trip and two afternoon field trips. Gy 1: Lec 3, Lab and field trips. *Cr* 4; Gy la: *Lec* 3, *Cr* 3.

Gy 2 (2a). Historical Geology—The geologic history of the earth and the development of life upon it. Laboratory includes study of selected fossils and various types of geologic maps. One-day field trip. Prerequisite: Gy 1 or Gy la. Gy 2: Lec 3. Lab 2, Field trip, *Cr* 4; Gy 2a: Lec 3, field trip. *Cr* 3.

Sociology and Anthropology

Ay 1/2. Introduction to Anthropology—The development of man as a bio-cultural phenomenon. Special emphasis on human paleontology and race formation as well as on the nature of culture and such human institutions as social organization, marriage, religion, economics, etc., among primitive people, with some application of derived principles to Western civilization. Required of majors. *Cr* 3.

Sy 3/4. Introduction to Sociology—The fundamental concepts, principles, and methods of sociology; analyzes the influence of social and cultural factors upon human behavior; evaluates effect of group processes, social classes, stratification, and basic institutions on contemporary society. The first semester (Sy 3) concentrates on concepts and principles; the second semester (Sy 4) on application of these to various social problem areas. *Cr* 3.

TWO-YEAR PROGRAM IN ADMINISTRATION

Options: A) Business B) Public

Objectives—The specific educational objectives of this career program in administration are:

1. to prepare the student for specific employment at the para-professional level in private industry or in the public sector;
2. to develop in the student an attitude of intellectual curiosity and an appreciation of education as a continuing process;
3. to assist the student for citizenship at home and in his community.

Transfer—All transfers from the Administration Program to baccalaureate programs will be considered on an individual student basis. Evaluations will be made by the program offering the baccalaureate degree. In general, the following criteria will be used in evaluating the advisability of such a transfer:

1. The student should have completed successfully the Administration Program.

2. His high school and/or college program should include all courses required for admission to the baccalaureate program to which transfer is requested.
3. The student's academic transcript should show strong evidence of high academic achievement in the Administration Program.
4. The kind and number of degree hours of transfer credit allowed toward a degree will vary with the nature of the baccalaureate program.
5. Upon successful completion of this program the student who has achieved a 2.75 grade point average or better will be considered for transfer to a four-year program on an individual basis.

Academic Progress—Students in the Administration Program are expected to maintain the same academic levels of standing as are currently in effect in other associate degree programs offered by various colleges or divisions of the University.

Degree—Upon successful completion of this program (60 credit hours at a minimum quality point average of 1.8) the student will be awarded an Associate of Science degree in Administration.

SPECIMEN CURRICULUM

First Year

FALL SEMESTER				SPRING SEMESTER			
		Subject	Credit Hours			Subject	Credit Hours
1	Hu	Communications Skills	3	2	Hu	Communications Skills	3
3	Hu	Dynamics of Human Behavior	3	4	Hu	Dynamics of Human Behavior	3
5	Pol	Political Science	3	6	Pol	Political Science	3
7	Ec	Economic Problems and Policies	3	8	Ec	Economic Problems and Policies	3
9	Ba	Accounting	3	10	Ba	Accounting	3
			15				15

Second Year

Business Administration Option

FALL SEMESTER				SPRING SEMESTER			
		Subject	Credit Hours			Subject	Credit Hours
11	Hu	The Human Enterprise: Man and Civilization	3	12	Hu	The Human Enterprise: Man and Civilization	3
23	Ms	Mathematical Inquiry I	3	24	Ms	Mathematical Inquiry II	3
19	Ba	Fundamentals of Business Management I	3	20	Ba	Fundamentals of Business Management II	3
27	Ba	Intermediate Accounting	3	28	Ba	Intermediate Accounting	3
		Electives:	3			Electives:	3
13	Ba	Electronic Data Processing	(3)	18	Ba	Sales Promotion	(3)
		or				or	
17	Ba	Marketing Problems and Policies	(3)	22	Ba	Personnel Administration	(3)
			15				15

Second Year

Public Administration Option

FALL SEMESTER				SPRING SEMESTER			
		Subject	Credit Hours			Subject	Credit Hours
11	Hu	The Human Enterprise: Man and Civilization	3	12	Hu	The Human Enterprise: Man and Civilization	3
23	Ms	Mathematical Inquiry I	3	24	Ms	Mathematical Inquiry II	3
11	Pol	Principles and Problems of Public Administration I	3	12	Pol	Principles and Problems of Public Administration II	3
13	Pol	Governmental Finance	3	18	Pol	Governmental Program Analysis	3
17	Pol	Public Planning	3	22	Ba	Personnel Administration	3
			15				15

TWO-YEAR PROGRAM IN GENERAL EDUCATION

Objectives—The General Education curriculum is designed primarily for students who for reasons of choice, preparation or ability do not enter traditional baccalaureate programs. When a student successfully completes the program and finds that his educational interests and achievements have evolved in the direction of continued education, he may apply for admission to a baccalaureate program. All such cases will be evaluated on an individual basis.

The specific educational objectives of the General Education Program include:

1. developing in the student an attitude of intellectual curiosity and an appreciation of education as a continuing process;
2. helping the student gain a better understanding of himself and the world in which he lives;
3. assisting the student for citizenship at home and in his community.

Transfer—All transfers from the General Education Program to baccalaureate programs will be considered on an individual student basis. Evaluations will be made by the program offering the baccalaureate degree. In general, the following criteria will be used in evaluating the advisability of such a transfer:

1. The student should have successfully completed the General Education Program.
2. His high school and/or college program should include all courses required for admission to the baccalaureate program to which transfer is requested.
3. The student's academic transcript should show strong evidence of high academic achievement in the General Education Program.
4. The kind and number of degree hours of transfer credit allowed toward a degree will vary with the nature of the baccalaureate program.
5. Upon successful completion of this program the student who has achieved a 2.75 grade point average or better will be considered for transfer to a four-year program on an individual basis.

Academic Progress—Students in the General Education Program are expected to maintain the same academic levels of standing as are currently in effect in other associate degree programs offered by various colleges or divisions of the University.

Degree—Upon successful completion of this program (60 credit hours at a minimum quality point average of 1.8) the student will be awarded an Associate of Arts degree in General Education.

Program Requirements

	Credit Hours
A. Communications	9
B. Humanities	6
C. Natural Sciences	9
D. Social Sciences	9
E. Electives	27
Total Hours	60

SPECIMEN CURRICULUM

First Year

FALL SEMESTER

		Subject	Credit Hours
1	Hu	Communications Skills	3
3	Hu	Dynamics of Human Behavior	3
11	Hu	The Human Enterprise: Man and Civilization	3
29	At	Understanding the Arts	3
		Elective	3
			15

SPRING SEMESTER

		Subject	Credit Hours
2	Hu	Communications Skills	3
4	Hu	Dynamics of Human Behavior	3
12	Hu	The Human Enterprise: Man and Civilization	3
30	At	Understanding the Arts	3
		Elective	3
			15

Second Year

FALL SEMESTER

		Subject	Credit Hours
23	Ms	Mathematical Inquiry I	3
25	Sc	Scientific Inquiry: Biological	3
		Electives	9
			15

SPRING SEMESTER

		Subject	Credit Hours
24	Ms	Mathematical Inquiry II	3
26	Sc	Scientific Inquiry: Physical	3
		Electives	9
			15

Electives

			Credit Hours
9/10	Ba	Accounting	3/3
13/14	Ba	Electronic Data Processing	3/3
17	Ba	Marketing Problems and Policies	3
18	Ba	Sales Promotion	3
19/20	Ba	Fundamentals of Business Management I & II	3/3
22	Ba	Personnel Administration	3
27/28	Ba	Intermediate Accounting	3/3
7/8	Ec	Economic Problems and Policies	3/3
31.32	Eh	The Worlds Literature in Perspective	3.3
39/40	Eh	The Literature of Black America	3/3
1/2	Fr	Elementary Conversational French	3/3
*Fr	1-2	Elementary French	3-3
*Fr	3/4	Intermediate French	3/3
15	Hy	The Twentieth Century World	3
5/6	Pol	Political Science	3/3
11/12	Pol	Principles and Problems of Public Administration	3/3
13	Pol	Governmental Finance	3
17	Pol	Public Planning	3

18	Pol	Governmental Program Analysis	3/3
*Ru	1-2	Elementary Russian	3-3
*Ru	3/4	Intermediate Russian	3/3
*At	1/2	Basic Drawing	2/2
*At	7/8	Basic Design	2/2
*At	9/10	Advanced Design	2/2
*At	11/12	Advanced Drawing	2/2
*At	13/14	Fundamentals of Painting	2/2
*At	17/18	Enameling	3/3

* Course descriptions for the courses are listed under the Liberal Studies program.

COURSE DESCRIPTIONS FOR TWO-YEAR ADMINISTRATION AND GENERAL EDUCATION PROGRAMS

Art

29. 30 At. Understanding the Arts—Concepts of the arts, basic forms and elements of the arts, and materials used in the arts: music, painting, architecture, drama, dance, sculpture, and drawing. *Cr* 3.

Business and Economics

18 Ad. Placement Training — Provides "on-the-job" training in production, distribution, manufacturing, retailing government service, etc. Experience will be gained in all facets of the enterprise. Work is under supervision of employer and University of Maine. *Cr* 3-6.

9 Ba. Accounting—An introduction to accounting principles, practices, and concepts including journals, ledgers, income, expenses, plus the accounting procedures and techniques involved in the preparation of simple financial statements. *Cr* 3.

10 Ba. Accounting—Preparation of financial statements, accounting procedure, changes in owners' investments, adjustments, adjusting and closing of account book, merchandising operations, special accounting techniques, forms of business organization, investments, inventory accounting, and accounting for fixed assets and long-term debts. Prerequisite: 9 Ba. *Cr* 3.

13/14 Ba. Electronic Data Processing—Development of a basic understanding of the uses of electronic data processing equipment. Application of electronic data processing equipment to accounting systems. Basic principles of operation and programming. Selected case studies. *Cr* 3.

17 Ba. Marketing Problems and Policies—Basic problems and practices in marketing management. Designed to give students an understanding of the marketing manager's job. Emphasis on the strategies of marketing, and on the designs of marketing mixes, each of these planning activities taking place in a changing economic, social, and political environment. *Cr* 3.

18 Ba. Sales Promotion—The use of advertising in marketing. (The principles and techniques of selling will be considered.) Case studies are used to determine situations in which advertising may be profitably employed. *Cr* 3.

19/20 Ba. Fundamentals of Business Management I, II—Forms of business organization, economic framework, the managerial functions, techniques of financial and credit management, the application of business records in managerial decision-making and concepts of managerial economics are presented

in light of the needs of a firm. Case study approach will be used in the second semester. Prerequisite: 7/8 Ec. *Cr* 3.

22 Ba. Personnel Administration — Principles and policies followed by modern scientific management in the procurement, development, direction, and conduct of personnel. Major emphasis is placed on organizational theory and those behavorial science concepts that provide the foundation for human behavior in industry and government. Prerequisite: sophomore standing. *Cr* 3.

27/28 Ba. Intermediate Accounting—Principles in regard to the evaluation and recording of working capital items and concurrent items, capital stock and surplus, statement analysis. Prerequisite: 9/10 Ba *Cr* 3.

7/8 Ec. Economic Problems and Policies—Background of the American economy, private enterprise, profits and price system, national income, employment and growth, price levels, economic fluctuations, money banking systems, savings, investment, stablization policies. *Cr* 3.

(Second Semester) The role of business enterprise in the economy; relations of supply, demand, and market prices; free competition, oligopoly, monopoly and competition under each; distribution of income, wages, rent, interest, and profit; the public economy and wages; the farm problem, labor unions and collective bargaining, social security systems, and comparative economic systems. *Cr* 3.

Communications and Literature

1. 2 Hu. Communications Skills—The objectives are to help the student to express his ideas clearly, correctly, and forcefully in oral and written communication. Also to deepen his understanding of literature and to acquaint him with the techniques of the research paper. *Cr* 3.

31. 32 Eh. The World's Literature in Perspective—An overall examination of world literature from its beginnings to modern times. Emphasis will be placed on the cultural forces that have gone into the creation of particular works of fiction, non-fiction, poetry and drama. *Cr* 3.

39/40 Eh. The Literature of Black America: The Forces That Shaped It; The Forces It Is Shaping—An examination of the literature of and about America's Blacks, with the focus upon the forces which produced our Black culture and the contribution of that culture to American society.

History

15 Hy. The 20th Century World—An investigation of the forces at work in the 20th century through a study of its personalities. The student will select a world figure as the subject of his class report. Prerequisite: sophomore standing. *Cr* 3.

Humanities

3/4. Hu. Dynamics of Human Behavior—This course explores the basic propositions of psychology, social psychology, and sociology. Attention will be given to work situations involving human relationships, leadership, and supervision. Social systems of community, family, religion, education, and economics will be emphasized. *Cr* 3.

11. 12 Hu. The Human Enterprise: Man and Civilization — A broad cultural survey presenting in synthesis man's achievements in all fields from his beginnings to modern times. The focus and emphasis will be on these achievements to give a sense of the inter-dependence of the human enterprise. First semester, beginnings through 1500. Second semester, 1500 to present. *Cr* 3.

Foreign Languages

1/2 Fr. Elementary Conversational French—Emphasizes speaking practical French. The student learns the most frequently used vocabulary and expressions of basic French through use of filmstrips and a taperecorder. In addition to regular class attendance, the student is expected to practice on his own at least one hour per week in the language laboratory. *Cr* 3. (Three hours per week in the classroom, plus one hour in the language lab)

Mathematics

23/24 Ms. Mathematical Inquiry I, II—A course designed to develop an appreciation of basic mathematical ideas. The major areas of concentration are logic, algebraic techniques, geometric concepts, and statistics ranging in application from business to scientific. *Cr* 3.

Political Science

5/6. Political Science—A survey of national, state and local government. The first semester includes the fundamental features of the American federal system and an analysis of the national government's structure and powers. The second semester includes the structure, powers, and functions of state and local government and an analysis of selected intergovernmental relationships. *Cr* 3.

11/12 Pol. Principles and Problems of Public Administration I, II—An introduction to the concepts of public administration including its development, environment, organization, management, financing, and accountability. Problems analyzed through cases and role-palying. Prerequisite: sophomore standing. *Cr* 3.

13 Pol. Governmental Finance—Study of basic elements of governmental financing, including taxation, budgeting, and accounting. Prerequisite: 5/6 Pol. *Cr* 3.

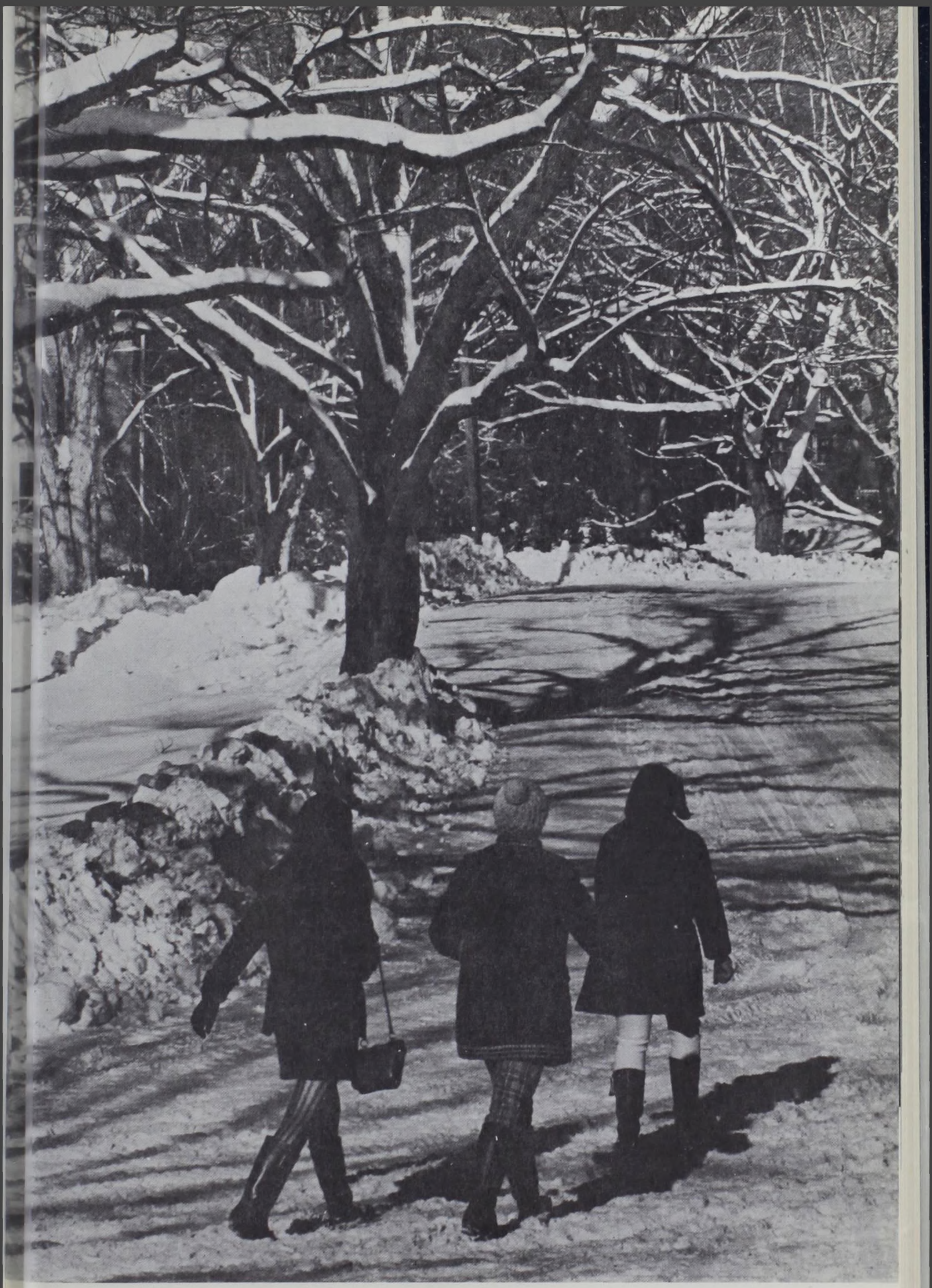
17 Pol. Public Planning—The structure and use of planning for governmental purposes, including comprehensive state, regional, and local planning. Prerequisite: 5 Pol or 7 Ec. *Cr* 3.

18 Pol. Governmental Program Analysis—The problems and techniques in analyzing present program operations and projecting future program needs on the basis of the final objectives or output factors. Prerequisite: 11 Pol. *Cr* 3.

Science

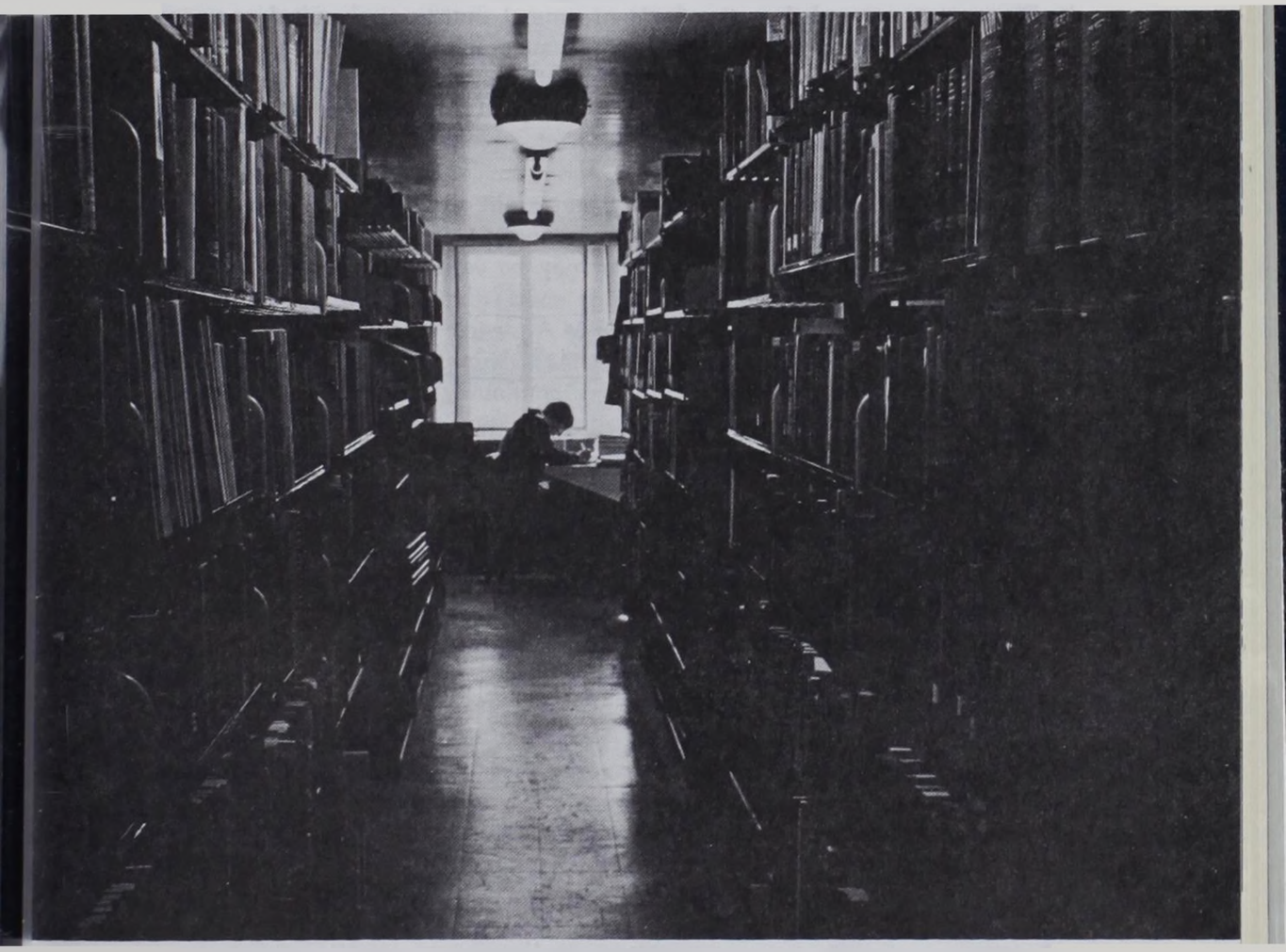
25 Sc. Scientific Inquiry: Biological—Evolution, genetics and functioning of the brain. The class will compare and contrast the scientific methods that have been applied to the study of living things. *Cr* 3.

26 Sc. Scientific Inquiry: Physical—The nature of the universe as understood by modern physical sciences and in methods of scientific inquiry as applied to the study of chemistry and physics. The class will analyze a number of scientific investigations, using as texts reports written by scientists in the field. *Cr* 3.



GRADUATE SCHOOL

FRANKLIN P. EGGERT, DEAN



Graduate School

Programs of study leading to degrees of master of agricultural and resource economics, master of arts, master of arts in teaching, master of business administration, master of science, master of education, master of engineering, master of library service, master of mechanical engineering, master of public administration, doctor of education and doctor of philosophy are offered by the University. The Ph.D. degree is awarded in the fields of animal nutrition, chemical engineering, chemistry, civil engineering, history, oceanography, physics, plant science, clinical psychology, general-experimental psychology and zoology.

The Certificate of Advanced Study, designed for teachers and school administrators, is awarded for the completion of a planned program of thirty hours of work beyond the master's degree.

Graduate programs in education and in certain other fields may be carried on, in whole or in part, during the Summer Sessions. A limited amount of credit toward the degree of master of education may be earned in continuing education courses given at various centers in the state and in the Continuing Education Division of the University. Candidates for the M.A. degree in English, history, and occasionally in other fields, may find it possible to complete a part of their work in C.E.D. classes. However, only six hours of continuing education work can be accepted toward the M.A. or M.S. degree in education.

The professional degree of forest engineer is granted upon completion of appropriate requirements.

The applicant who wishes to work toward the degree of master of arts or master of science is ordinarily expected to have had an undergraduate major or its equivalent in the field in which he proposes to do his advanced work. Applicants for most programs leading to the degree of master of education are expected to have had sufficient work in professional education to qualify for the appropriate type of certification. Teachining experience is also ordinarily expected.

Several scholarships of the value of a year's tuition are available to graduate students with outstanding undergraduate records. A number of departments require the services of graduate assistants, who devote part time to study while engaging in teaching or research duties.

A thesis usually is required of candidates for the M.A. and M.S. degrees. and is required for the Ph.D. degree and Ed.D. degree.

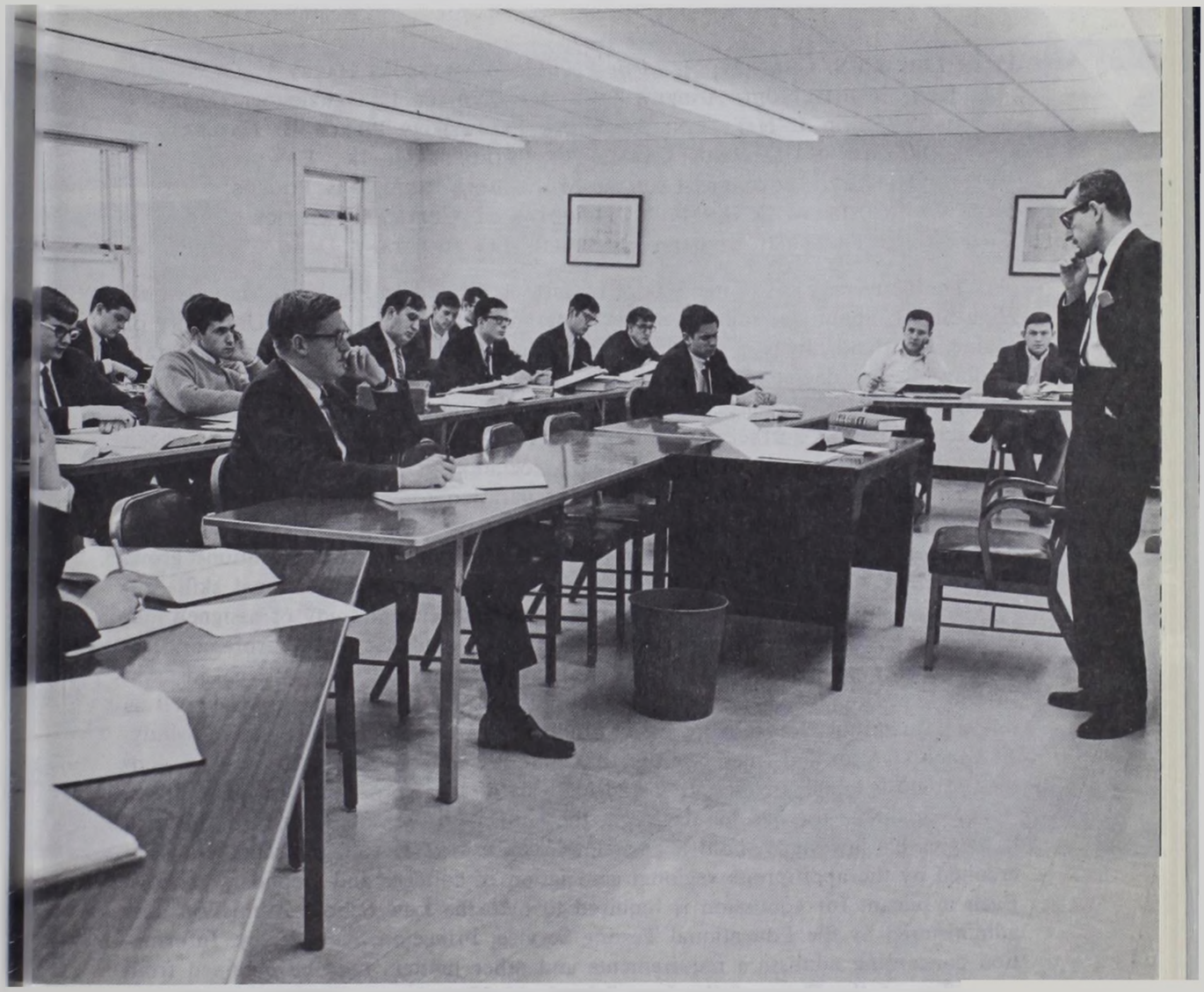
All work for the M.A., M.S., and non-thesis master's programs (with the exception of M.Ed.) must be completed within an eight-year period. The limit for the M.Ed., C.A.S., Ed.D., and Ph.D. degrees is 10 years.

The catalog of the Graduate School, containing more detailed information concerning graduate programs, may be obtained from the Office of the Graduate School, 2 Winslow Hall.

Students may not register for graduate degree credit until duly admitted to a program of graduate study at the University of Maine.

SCHOOL OF LAW, PORTLAND

EDWARD S. GODFREY, DEAN



School of Law, Portland

Dean Edward S. Godfrey; *Resident Faculty*—Professors Harry P. Glassman, L. Kivin Wroth, John Andrew Spanogle, Donald L. Garbrecht (Librarian), David J. Halperin; Associate Professors Pierce B. Hasler, Orlando E. Delogu, Gerald F. Petruccelli, Jr., Edwin A. Heisler; Lecturers Leonard M. Nelson, Richard E. Poulos, Cushman D. Anthony, Director of Clinical Practice Program; Richard F. Breen, Jr., Assistant Dean

The University of Maine School of Law is located in Portland, Maine, at 68 High Street, about one mile from the undergraduate campus of the University of Maine, Portland. It is a full-time day school, offering a three-year program leading to the degree of juris doctor. With its rapidly growing library, contaning over 78,000 volumes, the school serves as the chief center of teaching and research in law in northern New England. It is fully approved by the American Bar Association and is a member of the Association of American Law Schools.

The School of Law provides sound preparation for entry into the legal profession. The instruction familiarizes the student with basic principles of law, their purposes and social origins, and the processes by which legal institutions grow. Programs of legal writing, drafting, and advocacy develop professional skills.

A law student's work consists primarily of independent study of assigned materials as ground work for critical discussion under guidance of the professor. The classroom experience requires the student to apply, compare, and test legal ideas in varying fact situations. Precedents and authorities of many jurisdictions, as well as relevant materials drawn from other disciplines, are used as the basis for study. Although statutes and rules peculiar to Maine are noted, the course of study consists primarily of an investigation and analysis of legal processes and institutions.

A candidate for the law degree at the University of Maine must, by the time he begins his law study, hold a bachelor's degree from a college or universty accredited by the appropriate regional association of colleges and secondary schools. Each applicant for admission is required to take the Law School Admission Test administered by the Educational Testing Service, Princeton, New Jersey. Information concerning admission requirements and other matters may be obtained from the Office of the Dean of the Law School, 68 High Street, Portland, Maine. At the Orono campus of the University of Maine, information about the school may also be obtained from the Pre-law Adviser, Professor Robert B. Thomson, North Stevens Hall.

MISCELLANEOUS

Military Science

PROFESSOR OF MILITARY SCIENCE, LT. COL. FELL; ASSOCIATE PROFESSOR, MAJ. SPEKHARDT; ASSISTANT PROFESSOR, MAJ. RUGGERIO; ASSISTANT PROFESSORS CAPT. NORTON, CAPT. PAYNE; INSTRUCTORS, SERGEANT MAJOR SALLEY, SERGEANT FIRST CLASS MITCHELL; ADMINISTRATIVE CHIEF, SERGEANT FIRST CLASS HOFFMAN; SUPPLY CUSTODIAN, THOMAS GEAGHAN; SUPPLY CLERK, SPECIALIST FOURTH CLASS CARROLL

General—The Department of Military Science conducts the General Military Science curriculum prescribed by the Department of the Army for the Senior Division, Army Reserve Officers Training Corps. Under this program, Reserve commissions are awarded in the various branches of the Army after considering the preference and qualifications of the individual and the needs of the service. Commissions in the Regular Army are offered to selected students.

Purpose—The purpose of the Army ROTC is to train college students as junior officers who have the qualities and the attributes essential to their progressive development as Army officers, with particular emphasis on the United States Army Reserve. The senior division also provides junior officers for the Regular Army through the selection of a number of volunteers, under the Distinguished Military Graduate Program, for direct appointment as Regular Army second lieutenants.

Curriculum—The complete course of instruction is four academic years plus a summer camp of six weeks between the junior and senior years. For students transferring from other institutions and for other selected students, the four-year course may be compressed into two years; however, to gain necessary credit for the basic course, the compressing student must attend an additional six-week summer camp between the sophomore and junior year. The course is organized and correlated in sequence with the various four-year college curricula. For example:

Basic Course:

Mt 1 and 2, freshman year, 2 hours per week
Mt 3 and 4, sophomore year, 3 hours per week

Advanced Course:

Mt 5, junior year, 4 hours per week
Mt 6, junior year, 3 hours per week
Summer Camp, end of junior year, 6 weeks
Mt 7, senior year, 3 hours per week
Mt 8, senior year, 4 hours per week

During the freshman, junior and senior years, students complete some of the military instruction by taking selected subjects from a list of approved academic courses in the general areas of Science Comprehension, General Psychology, Effective Communication, and Political Institutions and Development. The aca-

demic subject must be the equivalent of 30 hours for freshmen, 45 class hours for juniors, and 45 class hours for seniors.

FALL SEMESTER

		Subject	Hours Rec	Lab	Cr
Mt	1	Military Science Basic	1	1	0*
Mt	3	Military Science Basic	2	1	0*
Mt	5	Military Science Advanced	3	1	3
Mt	7	Military Science Advanced	2	1	2

SPRING SEMESTER

		Subject	Hours Rec	Lab	Cr
Mt	2	Military Science Basic	1	1	0*
Mt	4	Military Science Basic	2	1	0*
Mt	6	Military Science Advanced	2	1	2
Mt	8	Military Science Advanced	3	1	3

*Grades included in College Accumulative.

GENERAL

Basic Military Science (Mt 1, 2, 3, 4)—All physically fit male citizens enrolled in the University of Maine are eligible for enrollment in the Basic Military Science Course (Two years).

Advanced Military Sciences (Mt 5, 6, 7, 8)—Students requesting admission to Advanced Military must: have completed Basic Military Science or have received credit for previous military training; meet the physical standards prescribed by the Department of the Army; be selected by the PMS and the President of the University according to their leadership, military ability, and potential as an officer in the Army Reserve. The general objective is to provide a basic military education, and in conjunction with other college disciplines, to develop individual character, leadership training and attributes essential to a military and civilian leader.

Credits—Credit for placement due to previous active military service or ROTC training toward admission into Advanced Military Science may be granted on the following basis:

Four or more months of active military service or active duty for training. Credit for placement for Mt 1, 2, 3, 4.

Previous training in the Army, Navy, Air Force, or Coast Guard Academies, and in the Army, Naval or Air Force ROTC. Credit for equivalent training.

Military School Division ROTC. Partial credit in accordance with Army Regulations.

Completion of Junior Division (high school) ROTC training. Credit not to exceed Mt 1, 2.

Completion of the six-week basic summer camp between Mt 4 and Mt 5. Credit for Mt 1, 2, 3, 4.

Enrollment—Basic Military Science cadets are issued modified officer-type uniforms free of charge for use during leadership laboratory. These uniforms must be returned to the Military Department at the end of each academic year and upon separation from the University.

Advanced Military Science cadets are provided regulation officer-type uniforms which remain in their custody while enrolled in the course. Upon successful completion of the course and upon graduation and appointment, these uniforms become their personal property. These uniforms can be modified by the addition of braid to conform with uniforms worn by officers on active duty.

Deferment—University Military Training and Service Act provides for the deferment of all Advanced Military Science ROTC members. Basic Military Science ROTC members who have satisfactorily completed Mt 1 may, at the discretion of the PMS, also be deferred.

Pay—Advanced Military Science cadets are paid an allowance of $50 per month for 10 months of each year. For the six-week period of Summer Camp they receive $193.20 plus rations, quarters, all necessary uniforms and equipment, and a monetary allowance for transportation at the rate of six cents per mile between their home of record, Summer Camp, and return. Upon completion of Mt 8 and graduation, qualified personnel are commissioned 2nd lieutenants in the U.S. Army Reserve. These officers receive a uniform allowance of $300 upon reporting for active duty to cover costs of necessary uniforms.

Obligation—Cadets commissioned as second lieutenants are required to serve on active duty for periods up to two years, dependent upon the needs of the service. Individuals being appointed in the Regular Army and personnel completing the Flight Training and Scholarship Program are required to serve on active duty for a period of three and four years respectively.

TWO-YEAR SCHOLARSHIP PROGRAM

The Department of Army offers a two-year scholarship to select sophomore cadets who have enrolled in the military program and who have demonstrated outstanding leadership and scholastic qualities. This scholarship pays full tuition for two years, all textbooks and laboratory fees, plus $50 a month for two years.

LEADERSHIP LABORATORY

General—Military leadership is taught using the brigade organization as a training vehicle. The brigade consists of a Brigade Headquarters, two battalions, and a separate Pershing Rifle Company. Individual cadets are assigned to positions of leadership and promoted to more advanced positions based on their leadership and experience.

The training of the cadet as a part of the brigade exposes him to the initial need-to-know military subjects from drill to field work. Maximum stress is placed on leadership by example, command responsibility, and completed staff action.

Organization: Brigade Headquarters—Brigade headquarters consists of a commander and full staff. This headquarters has the responsibility of direction and coordination of all brigade activities to include field exercises, physical fitness tests, drill competitions and the like.

Special Forces Battalion—The Special Forces Battalion meets for one two-hour evening period each week. The objective of this battalion's training program is the development of the individual. This is accomplished through a program which includes extensive physical training, hand-to-hand combat, all-weather survival, land navigation, small unit tactics, and close order drill. Maximum emphasis is placed on individual participation and accomplishment through which self-confidence and leadership are developed.

1st Battalion—The 1st Battalion meets for one single-hour evening period each week. The objectives of this unit are essentially the same as those for the Special Forces Battalion within the shorter time available.

Pershing Rifles—Company M, 12th Regiment, Pershing Rifles meets for one

two-hour evening period each week. This organization specializes in precision drill and functions as a unit within the National Pershing Rifles Organization as well as a company organic to the Maine Cadet Brigade. The company also receives extra field training in tactics, guerrilla warfare, and marksmanship. Operating within the framework of a nationwide military organization, company officers receive valuable training in personnel, operations and logistic duties and responsibilities. The company represents the University at the annual Regimental Precision Drill Meet.

ADDITIONAL COURSES

Flight Training—Army ROTC Flight Training is offered to selected senior ROTC cadets as an extracurricular subject at no extra cost. Upon completion of 35 hours ground instruction and 37½ hours in-flight instruction, cadets are eligible for a CAA pilot's certificate and are qualified for further Army flight training when on active duty. U.S. Army flight uniforms are provided for this instruction.

Rifle Markmanship Training—Offered to all enrolled ROTC students. The ROTC Rifle Team has an enviable record and has won many trophies. Those qualifying may compete in the scheduled varsity and ROTC matches. Rifle marksmanship is also a major sport of the University and is coached by the Military Department. Participation enables individuals to earn their freshman numerals and their varsity letter.

OTHER ACTIVITIES

20th Maine—The 20th Maine is the University of Maine Military Honor Society composed of the outstanding Advanced Course cadets. The Society is both a service and social organization serving the University and the Military Department. Objectives are to develop those leadership qualities essential for effective officers and to prepare members as educated men to take a more active part and have a greater influence in the military affairs of the communities in which they reside.

The 20th Maine holds meetings at which guest speakers appear and movies of interest are shown. The 20th Maine sponsors the social highlight of the year, the Military Ball.

Pershing Rifles—The Pershing Rifles is a national honorary military society established in 1894. The objective of the Pershing Rifles is to encourage, preserve, and develop the highest ideals of the military profession and to promote the American way of life. Company M, 12th Regiment, at the University of Maine, represents the University at several precision drill meets throughout the school year at various institutions. The Pershing Rifles provides the University with color guards, trick drill performances and military guards on various occasions.

Pershingettes—A girls' drill team, the Pershingettes was started in February 1966 and began with membership of 32 and big plans for the future. They hope to become nationally affiliated with the Pershing Rifles coed affiliates. This new group not only operates as a drill team but also acts as a service organization on the University campus. The drill team performs at football and basketball games, parades and invitational drill meets.

Physical Education and Athletics

Professors Westerman (Director), Woodbury, Sezak; Associate Professors Lepley, Hass, Brown, Butterfield, Cassidy, Styrna, Walkup; Assistant Professors Abbott, Anderson, Cobb, Folger, Jordan, Philbrick, Pickett, Wallace; Instructors Ames, Ballinger, Crichton, DeVarney, Hadley, MacKinnon, Ranney, Stoyell

The development of alert minds, strong wills, and healthy, enduring bodies is the goal of physical education at the University of Maine. As one factor in achieving this goal, participation in athletics and/or other forms of physical activity by all students is strongly encouraged.

Immediate responsibility for instruction, supervision, and guidance in this area rests with the Department of Physical Education and Athletics, a department comprising three divisions: the Division of Physical Education for Men, the Division of Physical Education for Women, and the Division of Intercollegiate Athletics.

PHYSICAL EDUCATION FOR MEN

Prescribed courses in physical education are required of all non-veteran freshmen. These courses are designed to improve body control and strength, to stimulate the development of mental and physical alertness, to establish habits of regular physical activity, to teach basic motor skills, and to provide experience in various kinds of recreative sports that may be enjoyed while in college and during later years. The program of activities is planned with due regard to individual differences so that it may be suited to the needs and adjusted to the capabilities of individual students. During the fall and spring, emphasis is placed on outdoor activities, while appropriate indoor activities are stressed during the winter.

Any student who has failed a Pe course because of lack of attendance must register for and pass both semesters of the required course.

A prescribed uniform is required for all physical education classes.

The Intramural Athletic Association, composed of one representative from each participating unit and acting under the supervision of the Division of Physical Education for Men, promotes general participation in athletics. Schedules are arranged in a wide variety of outdoor sports and each student is given an opportunity to engage in the activities of his choice with others of comparable skill. Teams representing the several dormitories, fraternities, and other housing units compete for championships in their respective leagues. As new interests develop, and when facilities can be made available, new sports are added. The program of intramural athletics is closely coordinated with the prescribed courses in physical education and with intercollegiate athletics to the end that "Athletics for All" may be a reality among Maine men.

Pe 1, 2. Physical Education—These courses or their equivalent are required of all non-veteran freshmen. Introduction and participation in outdoor and indoor games, fundamentals in individual activities, and participation in a program of physical fitness.

PHYSICAL EDUCATION FOR WOMEN

The role of physical education serves a vital part in the total program for the University woman. Instruction in the service program provides a means for physical development and maintenance of organic efficiency through a program of selected vigorous and moderate activities. Providing knowledge of structure and function for the basic tool of movement—the body—and providing satisfying opportunities for manipulating the body with or without an implement are also purposes of instruction. The Service Program is equally concerned with encouraging the pursuit of exercise as a pleasurable and healthy habit and instilling appreciation, respect, and love for participation in activity.

The University requirement for physical education for women is governed by each individual college. At present, each college requires two semesters of physical education to be completed in the freshman year.

The Department of Physical Education for Women believes that progress which is consistent with its philosophy may best be achieved through the following recommendation:

To fulfill the one-year requirement, students may elect two of three areas. The areas are designated as: 1) Individual and Dual or Team Sports; 2) Dance; 3) Fitness or Gymnastics. When the area requirements are satisfied, the student is free to select any activity with the stipulation that it not be a repeat activity.

Within each area there is a variety of different activities for which the student may register. This allows the student to choose the activities in which she has an interest and would enjoy.

Students with activity restrictions, because of health, are scheduled into the Service Program by the Division of Physical Education for Women on recommendations from the University Student Health Service. The student must first go through the University Health Service for classification and then through the Physical Education Department for activity scheduling. The student then remains in the restricted program unless she is reclassified by the University Health Service.

Pe 1, 2. Physical Education—Activities are chosen from two of the following areas: 1) Team Sports, (basketball, field hockey, volleyball, lacrosse) and/or Individual Sports, (archery, badminton, fencing, golf, riflery, skiing, tennis); 2) Fundamentals of Gymnastics of Fitness; 3) Dance (modern or folk). Two hours a week. No credit.

INTERCOLLEGIATE ATHLETICS

As an integral part of the University's program of physical education, intercollegiate athletics help to serve the general purposes of that program. In addition, they constitute an effective means of maintaining interest in all-round physical fitness; they set standards of excellence in physical efficiency; they provide a wholesome and natural common interest around which University loyalties may be rallied and institutional esprit developed; and they afford experience in emotional control and in the capacity to think quickly and act vigorously while under the pressure of strong opposition.

Intercollegiate athletics are governed by an Athletic Advisory Board, the membership of which is representative of the University faculty and administration, the Board of Trustees, the alumni, and the undergraduates. Regular schedules are arranged and expert coaches are provided for the following sports: baseball, basketball, cross-country, football, golf, rifle, sailing, soccer, tennis, track, winter sports, and wrestling. Provision is made for freshman as well as varsity competition in these sports. In coaching procedures and in all other particulars the program is conducted with primary concern for the best interests of the individual participant and his relationship toward the broader objectives of the University.

FACILITIES

The University facilities for athletics and physical education are listed on page 23.

Continuing Education Division

The Continuing Education Division is a part of the University of Maine Public Service Division. The primary function of the division is to coordinate the part-time study of adults in various Maine communities during later afternoon, evening and Saturday classes. Educational opportunities through C.E.D. are available at about 25 locations within Maine. An increasing number of courses are available by means of Educational Television. Television courses are administered by the Continuing Education Division. Courses offered by means of the division may be for degree credit or non-degree credit. Courses are available occasionally over radio, also.

This division provides a source of continuing education for mature and qualified persons who wish to supplement an earlier education. Programs offered may sometimes be applied toward degree programs or may be primarily for professional or personal use. However, all programs offered are designed to prepare adults to meet the challenges of a rapidly changing world and provide experiences in learning which will lead to a fuller and richer life.

Adult students in C.E.D. classes have varied backgrounds and interests. Most of them carry on full-time occupations, have graduated from high school some time ago, and have determined for themselves the need for earning a degree or for specific courses to be used for personal or occupational development. A number of students have recently graduated from high school and are beginning their college career by commuting to C.E.D. classes before transferring to a campus.

A large variety of degree credit, non-degree credit and special short courses are available in many locations, operated by the C.E.D. Specific information concerning subjects currently available may be obtained from University of Maine Extension Service agents or from members of the Continuing Education Division at Orono, Portland, Presque Isle, Auburn and Augusta. C.E.D. personnel will be able to advise students on registration procedures for courses available. Regular tuition charges or nominal fees are charged for programs offered.

The Continuing Education Division also assists in the administration of many conferences and seminars conducted on the Portland, Augusta and Orono campuses.

Summer Session

The University offers a 12-week Summer Session of professional courses in elementary and secondary education, and academic subjects. In addition, special workshops in both elementary and secondary education are conducted for a period of three weeks. Some courses are organized on a three-week basis, thereby enabling the student who enrolls for a workshop to complete a full six-week Summer Session schedule. Several conferences on special educational problems, usually lasting a week, are available for students who are interested in them.

The session also affords opportunities for students in the University of Maine or other similar institutions to secure credits toward a degree, thus enabling them to accelerate their program. Students from other colleges of the University system who are admitted to advanced standing as candidates for the bachelor's degree in the College of Education may do a considerable part of their work in the Summer Session.

As an integral part of the University organization, the Summer Session has similar standards of academic achievement. The faculty consists of members of the University staff and numerous visiting professors from other institutions.

The session is for the benefit of teachers and school administrators who desire to take professional courses in the field of education or to pursue other subjects which may be helpful to them in connection with their work. Hence, special attention is given to teachers' courses in the various subjects offered.

The facilities of the Summer Session are open to both men and women, and students are admitted without examinations. The requirements for admission are, in general, the same as those for the other sessions of the University. Students are expected to have completed as a minimum preparation a standard high school course or its equivalent.

Transcripts for work previously done are necessary only when the student plans to become a candidate for a degree at the University of Maine. New students who expect to become candidates for the master's degree should communicate with Dr. Franklin P. Eggert, Dean of Graduate Study.

Classes meet five times a week, Monday to Friday inclusive. The normal registration for the six-week session is for two or three courses.

Registration for the Summer Session is held early in June, and the session ends early in September. (See 1969-70 calendar, page 4.) The bulletin describing courses offered during this period is issued about March 15. For further information concerning the program address Director of the Summer Session, Orono, Maine 04473.

Educational Television

The University of Maine owns and operates WMEB-TV, Channel 12, Orono; WMEM-TV. Channel 10, Presque Isle; WMED-TV, Channel 13, Calais, and translator stations WO4AR, Channel 4, Madawaska, and WO4AY, Channel 4, St. Francis, which together comprise the State of Maine ETV Network. The five stations are interconnected by microwave relay with a central programming source at the University. The stations also are interconnected with ETV stations WCBB, Augusta; WENH-TV, Durham, N. H.; WGBH-TV, Boston, Mass.; the Vermont ETV Network; and on a part-time basis with The National Educational Television network facilities in New York and Washington, D. C. Each station maintains a regular schedule of programs for adults and for children, both for home and for in-school use.

Studio and control facilities for the State of Maine ETV Network are located in Alumni Hall on the Orono campus. The facilities contain equipment for the production and recording of television programs, and the distribution of these programs to each of the stations. Programming on the network comes from three main sources: National Educational Television, the Eastern Educational Network, and the University of Maine. Of the locally produced programs, a number are presented in cooperation with other educational, cultural and public service organizations of the state.

An expanding closed circuit television system (CCTV) currently interconnects several classroom buildings on both the Orono and Portland campuses with the Alumni Hall facilities. A number of courses in Orono and Portland are taught, in part, by television using these facilities.

Both the network and closed circuit television operations offer students an excellent opportunity for part-time employment and training in the broadcast fields.

Personnel

EMERITI

ASHMAN, ROBERT IRVING (1930-1957); A.B., Cornell University, 1913; M.F., Yale, 1929; Sc.D., Maine, 1957; Professor Emeritus of Forestry.

BAILEY, RUSSELL MANLEY (1931-1967); B.S., Maine, 1928; Associate Professor Emeritus of Genetics.

BAKER, GREGORY (1935-1968); B.S., Maine, 1924; M.F., Yale, 1939; Professor Emeritus of Forestry.

BEVERLY, VERNE CURTIS (1923-1956); B.S., Maine, 1920; County Agent Emeritus.

BEYER, FRANK KEMP (1947-1968); B.S., Cornell University, 1929; M.S., University of Wisconsin, 1930; Associate Professor Emeritus of Forestry.

BOARDMAN, HAROLD SHERBURNE (1901-1934); B.C.E., Maine, 1895; C.E., 1898; Eng.D., 1922; LL.D., Colby, 1927; Eng.D., Rhode Island, 1928; LL.D., Bates, 1929; President Emeritus.

BOGAN, EDGAR JUNIOR (1929-1968); A.B., Miami (Ohio), 1926; A.M., Princeton, 1929; Ph.D., Ohio State, 1947; Professor Emeritus of Chemistry.

BONNEY, LUTHER ISAAC (1957-58); B.A., Bates, 1906; M.A. (Hon.), 1951; Sc.D. in Ed., Maine, 1959; Dean Emeritus, University of Maine in Portland.

BRANN, BERTRAND FRENCH (1909-1953); B.S., Maine, 1909; M.S., 1911; S.M., Massachusetts Institute of Technology, 1912; Professor Emeritus of Chemistry.

BRIWA, KATHRYN ELIZABETH (1941-1960); A.B., Vassar, 1915; M.A., Columbia, 1929; Ph.D., 1940; Nutrition Specialist Emerita.

BUZZELL, MARION STEPHANIE (1919-1958); B.A., Maine, 1914; M.A., 1915; Associate Professor Emerita of Romance Languages.

CLAPP, ROGER (1929-1969); B.S., Cornell University, 1928; M.S., Maine, 1932; Associate Professor Emeritus of Ornamental Horticulture.

CLAYTON, MARY MORRIS (1934-1956); B.S., Columbia, 1918; M.S., Rochester, 1926; Ph.D., 1929; Nutritionist Emerita.

COMEGYS, ESTHER (1941-1960); B.A., Wellesley, 1921; M.A., University of Pennsylvania, 1926; Ph.D., Radcliffe, 1941; Associate Professor Emerita of Mathematics.

CORBETT, RALPH ASHTON (1930-1966); B.S., Maine, 1930; M.S., Wisconsin, 1949; Extension Dairy Specialist Emeritus.

CRABTREE, KENNETH GERARD (1926-1964); S.B., Massachusetts Institute of Technology, 1923; P.E. (Maine); Professor Emeritus of Electrical Engineering.

CRANE, PERCY FREMONT (1936-1958); B.S., Bowdoin, 1917; Director of Admissions Emeritus.

CRAWFORD, JOHN RAYMOND (1930-1962); B.A., Culver-Stockton, 1924; M.A., State University of Iowa, 1929; Ph.D., 1931; Professor Emeritus of Education.

CREAMER, WALTER JOSEPH (1919-1961); B.S., Maine, 1918; E.E., 1921; B.A., 1923; Professor Emeritus of Communication Engineering.

CROSBY, RUTH (1929-1962); A.B., Mount Holyoke, 1919; A.M., Radcliffe, 1920; Ph.D., 1929; Professor Emerita of English.

CROSSLAND, CHARLES EDWARD (1917-1961); B.S., Maine, 1917; LL.D., 1962; Vice President for Administration Emeritus.

CURTIS, THEODORE SMALL (1930-1966); B.S., Maine, 1923; Faculty Manager of Athletics Emeritus.

DAY, CLARENCE (1913-1953); M.S., Maine, 1929; Extension Editor Emeritus.

DIRKS, CHARLES ORVILLE (1927-1960); B.S., Kansas State College, 1924; M.S., Iowa State College, 1925; Ph.D., Cornell University, 1935; Professor Emeritus of Entomology.

DOTEN, HENRY LEROY (1939-1964); B.S., Maine, 1923; C.E., 1942; P.E., (Maine); Business Manager Emeritus.

DOW, EDWARD FRENCH (1929-1969); B.S., Bowdoin, 1925; A.M., Harvard, 1926; Ph.D., 1932; Professor Emeritus of Government.

DOW, GEORGE FARRINGTON (1927-1969); B.S., Maine, 1927; M.S., 1929; Ph.D., Cornell University, 1938; Director Emeritus of the Maine Agricultural Experiment Station.

EASTMAN, CHARLES LESLIE (1925-1966); B.S., Maine, 1922; Extension Agent Emeritus.

EDWARDS, HERBERT JOSEPH (1947-1969); B.A., Ohio State, 1923; A.M., Princeton, 1927; Ph.D., Ohio State, 1930; Professor Emeritus of English.

EVANS, WESTON SUMMER (1923-1962); B.S., Maine, 1918; M.S., 1923; Sc.D., 1962; P.E. (Maine); Dean Emeritus of Technology.

FIFE, HILDA MARY (1946-1969); A.B., Colby, 1926; A.M., Cornell University, 1933; Ph.D., 1941; Professor Emerita of English.

FOLSOM, DONALD (1918-1957); A.B., Nebraska, 1912; M.A., Minnesota, 1914; Ph.D., 1917; Plant Pathologist Emeritus.

FOSTER, FRANK CLIFTON (1947-1960); B.S., Colby, 1916; B.D., Union Theological Seminary, 1924; M.A., Columbia 1924; Ph.D., 1933; Professor Emeritus of Education.

GANNETT, JAMES ADRIAN (1908-1953); B.S., Maine, 1908; M.A., (Hon.), 1928; Registrar Emeritus.

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STEINMETZ, FERDINAND HENRY (1922-1954); B.S., Illinois, 1915; M.S., Minnesota, 1921; Ph.D., 1926; Pd.D., Eastern Illinois State College, 1949; Professor Emeritus of Botany.

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SWIFT, HAROLD CLAYTON (1920-1961); B.S., Maine, 1918; M.S., 1923; Associate Professor Emeritus of Agricultural Engineering.

TURNER, ALBERT MORTON (1922-1956); A.B., Harvard, 1912; A.M., 1914; Ph.D., 1920; Professor Emeritus of English and Comparative Literature.

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WEBSTER, FRED LOT (1944-1961); County Agent Emeritus.

WHITMORE, ALBERT AMES (1915-1949); B.S., Maine, 1906; M.A., 1917; Professor Emeritus of History.

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Lloyd H. Elliott Professor of English (position vacant).

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BANKS, RONALD FILLMORE (1963); B.S., Gorham State Teachers College, 1956; M.A., Maine, 1958; Ph.D., 1966; Assistant Professor of History; Assistant to the President.

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BARDEN, ALBERT ARNOLD, JR. (1946); A.B., Brown, 1932; Sc.M., 1934; Ph.D., NORTHWESTERN, 1941; Professor of Zoology.

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RICHARDS, CHARLES DAVIS (1952); B.A., Wheaton College, Illinois, 1943; M.A., University of Michigan, 1947; Ph.D., 1952; Professor of Botany.

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RIDGWAY, GEORGE J.; B.S., University of Washington, 1949 M.S., 1951; Ph.D., 1954; Lecturer in Zoology.

RIDGWAY, RITA KELL (1966); B.S., James Millikin University, 1936; Extension Agent (Androscoggin-Sagadahoc Counties), Cooperative Extension Service.

RIOUX, ROBERT NORMAND (1959); B.A., University of Connecticut, 1949; M.A., Oklahoma State University, 1950; Doctorat d'université de Paris en Lettres, 1956; Associate Professor of Romance Languages.

ROBBINS, WALLACE CLIFTON (1965); B.S., Maine, 1954; M.S., University of New Brunswick, 1956; Instructor in Forest Resources.

ROBERTS, DODD EDWARD (1964); B.A., Maine, 1951; M.A., 1955; Ed.D., University of Missouri, 1958; Associate Professor of Education.

ROBERTS, FRANKLIN LEWIS (1964); B.S., Maine, 1955; M.S., 1957; Ph.D., North Carolina State College, 1964; Associate Professor of Zoology.

ROBERTS, JAMES WESTON (1967); B.A., San Diego State College, 1954; Assistant Professor of Political Science, University of Maine, Portland.

ROBERTS, LEWIS POLLARD (1935); B.S., Maine, 1931; Sugar Beet Specialist, Cooperative Extension Service.

ROBERTSON, CRAIG ANDREW (1969); B.A., University of Kansas, 1961; M.A., 1965; Assistant Professor of History.

ROBINSON, JAMES ARTHUR (1956); B.S., Maine, 1950; Area Potato Specialist, Cooperative Extension Service.

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†ROCKMORE, DAVID MEURICE (1966); B.S., Pennsylvania State University, 1956; D.Phil. Oxford University, 1963; Assistant Professor of Physics.

RODERICK, THOMAS HUSTON; A.B., University of Michigan, 1952; B.S., 1953; Ph.D., University of California, 1959; Lecturer in Zoology (Jackson Laboratory).

ROGERS, CARL ADEN (1944); B.S., Vermont, 1935; M.S., Kansas State University, 1964; Extension Agent (Hancock County), Cooperative Extension Service.

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ROGGENBAUER, JOSEPH (1961); Diplomkaufmann, University of Vienna, Austria, 1950; M.A., Middlebury, 1965; Doctorate, University of Innsbruck, Austria, 1953; Associate Professor of German.

ROMANYSHYN, JOHN MIKE (1946-1950) (1953); B.A., University of Oklahoma, 1942; M.A., University of Chicago, 1952; Margaret Payson Professor of Social Welfare, University of Maine, Portland.

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ROURKE, ROBERT VINCENT (1964); B.S., Maine, 1959; M.S., 1964; Assistant Professor of Plant and Soil Sciences, Agricultural Experiment Station.

ROWE, RICHARD JAY (1959); B.S., Cornell University, 1952; B.S., Iowa State University, 1957; M.S., 1959; P.E. (Maine); Associate Professor of Agricultural Engineering.

RUGGERIO, CAPTAIN DOMINIC WILLIAM (1969); B.A., Norwich University, 1961; Assistant Professor of Military Science.

RUSS, CHARLES ROGER (1965); B.S., Marquette University, 1959; M.S., 1961; Ph.D., University of Pennsylvania, 1965; Assistant Professor of Chemistry.

RUSSELL, ELIZABETH SHULL (1969); A.B., University of Michigan, 1933; M.A., Columbia University, 1934; Ph.D., University of Chicago, 1937; Lecturer Zoology.

RUSSELL, OLGA WESTER (1966); A.B., Connecticut College, 1934; A.M., University of California (Berkeley), 1939; A.M., Radcliffe, 1944; Ph.D., 1957; Professor of French.

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SALDANHA, ESTELITA LONGUINHOS (1966); B.S., University of Nebraska, 1946; M.A., 1947; Ph.D., Cornell University, 1950; Professor of Psychology, University of Maine, Portland.

SALEEBEY, MICHAEL DENNIS (1967); B.A., University of California, Santa Barbara, 1958; Master of Social Welfare, University of California, Los Angeles, 1960; Assistant Professor of Social Welfare, Department of Sociology and Anthropology.

SANBORN, JANE OBERHOLTZER (1961); A.B., Wilson College, 1942; Ed.M., University of California, 1961; Ed.D., University of California at Los Angeles, 1961; Director of Testing and Counseling, and Associate Professor of Psychology, University of Maine, Portland.

SANDERS, JOSEPH FRANCIS; B.S., Boston University, 1947; M.A., 1948; Ph.D., 1953; Lecturer in Psychology, V.A. Center, Togus.

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Sanford, Alpheus (1958); B.A., Maine, 1947; M.Ed., Boston University, 1954; Ed.D., 1959; Professor of Education.

Saper, Bernard (1969); B.A., Brooklyn College, 1946; M.A., Columbia, 1947; Ph.D., University of California (Berkeley), 1951; Professor of Psychology.

Sass, Bernard (1946); B.S., City College of New York, 1934; M.A., Teachers College, Columbia, 1936; Associate Professor of Zoology.

Saunders, Bruce Thomas (1969); B.S., Villanova University, 1964; Assistant Professor of Education.

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Sawin, Paul B.; B.S., Cornell University, 1924; M.S., Kansas State University, 1925; M.S., Harvard, 1930; Sc.D., 1931; Lecturer in Animal Sciences (Jackson Laboratory).

Schemnitz, Sanford David (1962); B.S., University of Michigan, 1952; M.S., University of Florida, 1953; Ph.D., Oklahoma State University, 1958; Associate Professor of Wildlife Resources.

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Schneider, Walter Leslie (1964); B.M.E., Pratt Institute, 1948; M.M.E., Yale University, 1950; Dr. Eng. Sc., New York University, 1958; Associate Professor of Mechanical Engineering.

Schoenberger, Walter Smith (1956); A.B., University of Pittsburgh, 1950; M.A., 1953; M.A., The Fletcher School of Law and Diplomacy, 1954; Ph.D., 1963; Professor of Political Science.

Schomaker, Charles Edward (1963); B.S., Pennsylvania State University, 1950; M.F., 1954; Ph.D., Michigan State University, 1961; Associate Professor of Forest Resources.

Schomaker, Peggy K. (1966); B.S., Pennsylvania State University, 1949; M.S., 1957; Ph.D., Michigan State University, 1961; Assistant Professor of Home Management; Consumer Economics Specialist, Cooperative Extension Service.

Schriver, Edward Oswald (1968); B.S., Gorham State College, 1954; M.Ed., Maine, 1955; B.D., Andover Newton Theological School, 1960; M.A., Maine, 1961; Ph.D., 1967; Lecturer in History and Archivist of Raymond H. Fogler Library.

Schumacher, John Floyd (1966); A.B. ,Bowdoin College, 1965; M.A., Maine, 1967; Assistant Professor in English, University of Maine in Augusta.

Schwanauer, Francis (1962); Ph.D., Stuttgart and Tübingen (Germany), 1959; Associate Professor of German, University of Maine, Portland.

Scimecca, Joseph Andrew (1969); B.A., Hunter College, 1962; M.A., New York University, 1965; A.B.D., 1968; Assistant Professor of Sociology.

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SEAMAN, KATHERINE ELDEANE (1968); B.A., University of Denver, 1966; Instructor in English.

SENSENIG, DAVID M.; B.S., Haverford College, 1942; M.D., Harvard Medical School, 1945; Lecturer in Biochemistry.

SEZAK, SAMUEL (1939); B.A., Maine, 1931; M.Ed., 1953; Professor of Physical Education.

SEZAK, WILLIAM (1946-1948) (1949); B.S., in Ed., Boston University, 1938; M.Ed., Maine, 1946; Ed.D., Columbia, 1956; Professor of Sociology; and Acting Chairman, Department of Sociology.

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SHIBLES, MARK RICHARD (1947); B.A., Colby, 1929; M.Ed., Boston University, 1935; L.H.D., Colby, 1954; Sc.D. in Ed., Boston University, 1955; Dean of the College of Education, Director of the Summer Session, and Professor of Education.

SHIGO, ALEX LLOYD, B.S., Waynesburg College, 1956; M.S., West Virginia University, 1958; Ph.D., 1959; Lecturer in Botany.

SHIN, ROY W. (1969); B.A., Macalester, 1958; M.A., 1962; Ph.D., Minnesota, 1969; Assistant Professor of Political Science.

SHOTTAFER, JAMES EDWARD (1964); B.S., State University of New York, 1954; M.S., State University of New York and Syracuse University, 1956; Ph.D., Michigan State University, 1964; Associate Professor of Wood Technology.

SHULER, CRAIG EDWARD (1969), B.S., Colorado State University, 1960; M.S., 1966; Assistant Professor of Forest Resources.

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SIMARD, GERALD LIONEL (1967); B.S., Bates, 1933; Ph.D., Massachusetts Institute of Technology, 1937; Associate Professor of Chemical Engineering.

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SINGERMAN, ALAN JAY (1968); A.B., Ohio University, 1964; Diplome, University of Paris, 1962; M.A., Indiana University, 1966; Instructor in French.[4]

SINGERMAN, LUCRETIA VIRGINIA (1968); B.A., Ohio University, 1964; M.A., Indiana University, 1967; Instructor in German.

[4] On leave of absence, 1969-70.

SKORPEN, ERLING RAYMOND (1968); A.B., College of Idaho, 1954; B.A., Oxford University, 1956; M.A., 1958; Ph.D., Yale University, 1960; Associate Professor of Philosophy.

SMALL, WILLIAM ULLRICH (1967); B.S., Bowdoin College, 1949; M.B.A., Columbia University, 1951; Center Director (Presque Isle), Continuing Education Division.

SMITH, ALLEN GUY (1967); B.Sc., Mount Allison University (New Brunswick), 1949; M.Sc., University of New Brunswick; 1951; Ph.D., Maine, 1966; Associate Professor of Chemistry, University of Maine, Portland.

SMITH, ALLAN BUNKER.; B.A., Bates College, 1927; M.S., University of Connecticut, 1949; Ph.D., 1953; Part-time Instructor in Education, Division of Social Science. University of Maine, Portland.

SMITH, CHARLES WILLIAM, JR. (1968); B.S., Allegheny College, 1962; Ph.D., Ohio University, 1968; Assistant Professor of Physics.

SMITH, DAVID CLAYTON (1965); B.S., in Ed., Farmington State Teachers College, 1955; M.Ed., Maine, 1956; M.A., 1958; Ph.D., Cornell University, 1965; Assistant Professor of History.

†SMITH, HADLEY E. (1967); A.B., Eastern Nazarene College, 1951; M.A., University of California, 1954; Ph.D., 1963; Associate Professor of Economics, University of Maine, Augusta.

SMITH, NORMAN (1962); B.Sc., Leeds (England), 1952; M.Sc., Durham (England), 1954; M.S., Maine; 1959; Professor and Head, Department of Agricultural Engineering.

SOTTERY, THEODORE WALTER (1956); B.N.S., Dartmouth, 1946; M.S., Maine, 1956; Ph.D., 1966; Associate Professor of Chemistry, University of Maine, Portland.

SOULE, HAYDEN MAYO, JR. (1960); B.S., Maine, 1960; M.S., 1968; Associate Professor of Agricultural Engineering.

SOULE, WILLIAM HILTON (1965); A.B., Bowdoin, 1936); M.Ed., Bates, 1941; Ed.D., Boston University, 1967; Associate Professor of Education, University of Maine, Portland.

SOULE, WILLIAM LAMSON, JR. (1966); A.B., Harvard College, 1953; M.E.A., The George Washington University, 1963; Assistant Professor of Mathematics.

SPANOGLE, JOHN ANDREW, JR. (1964); B.S.E., Princeton University, 1957; J.D., University of Chicago, 1960; Professor of Law, School of Law, Portland.

SPEICHER, BENJAMIN ROBERT (1937); A.B., Denison, 1929; M.S., Pittsburgh, 1931; Ph.D., 1933; Professor of Zoology.

SPEKHARDT, MICHAEL STEPHAN (1968); Major, Artillery, U.S. Army; B.A., Seton Hall University, 1957; Assistant Professor of Military Science.

SPRAGUE, RICHARD STANTON (1956); B.A., Maine, 1949; M.A., Yale, 1951; Ph.D., Boston University, 1961; Associate Professor of English.

SPROUL, OTIS JENNINGS (1955); B.S., Maine, 1952; M.S., 1957; Sc.D., Washington University, 1961; P.E., Maine; Professor of Civil Engineering.

SPURLOCK, DEBORAH QUIRK (1967); B.S., University of Massachusetts; 1965; Instructor in Nursing.

STANLEY, ROBERT DANA (1967); B.A., University of Maine, 1958; M.A., 1963; Director of Student Memorial Union and Arthur A. Hauck Auditorium.

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STEARNS, WILLIAM FRANKLIN (1960); B.S. in Ed., Maine, 1958; M.A., 1960; Assistant Professor of Mathematics.

STEELE, WILLIAM PAUL (1967); B.S. in Ed., Maine, 1964; M.A., 1967; Assistant Professor of Speech, University of Maine, Portland.

STEINMAN, RICHARD (1966); B.A., University of Missouri, 1949; M.S., Columbia University, 1952; Ph.D., 1968; Assistant Professor of Social Welfare, University of Maine, Portland.

STEVENS, FRANCIS ROBERT (1957); B.S., Maine, 1951; Area Poultry Specialist, Cooperative Extension Service.

STEVENS, LEROY CARLTON; B.S., Cornell University, 1942; Ph.D., University of Rochester, 1952; Lecturer in Zoology.

STEVENS, MARGARET F. (1951); B.S., Simmons, 1934; Youth Education Specialist, Cooperative Extension Service.

**STEWART, ALICE ROSE (1947); B.A., Maine, 1937; A.M., Radcliffe, 1938; Ph.D., 1946; Professor of History.

STEWART, DONALD M. (1968); B.A., Maine, 1935; M.A., 1937; Executive Director, General Alumni Association.

STILES, DWIGHT GOULD (1968); B.S., University of New Hampshire, 1942; Area Potato Specialist, Cooperative Extension Service.

STILES, WARREN CRYDER (1962); B.S., Rutgers, 1954; M.S., 1955; Ph.D., Pennsylvania State University, 1958; Professor of Pomology; Extension Fruit Specialist, Cooperative Extension Service.

STOLT, SANDRA LONKO (1969); B.A., Maine, 1969; Research Associate, Forest Resources.

STONE, JUDITH THELMA (1968); B.S., Maine, 1964; M.S.N., University of Pennsylvania, 1966; Instructor in Nursing, School of Nursing.

STONE, WILLIAM FRANK (1966); B.A., Maine, 1956; M.A., University of Florida, 1961; Ph.D., 1963; Associate Professor of Psychology.

STORCH, RICHARD HARRY (1965); B.A., Carleton College, 1959; M.S., University of Illinois, 1961; Ph.D., 1966; Associate Professor of Entomology.

STOYELL, PAUL DEWITT (1968); B.S., Ithaca College, 1964; Instructor in Physical Education and Varsity Soccer Coach.

STRUCHTEMEYER, ROLAND AUGUST (1946); B.S., University of Missouri 1939; M.A., 1941; Ph.D., Ohio State University, 1951; Professor of Soils and Head, Department of Plant and Soil Sciences.

STURGEON, RICHARD HOWARD (1962); B.S., Maine, 1960; M.Ed., 1966; Assistant Professor of Education, Coach of Basketball and Baseball, University of Maine, Portland.

STYRNA, EDMUND (1956); B.S., New Hampshire, 1948; Associate Professor of Physical Education, Head Coach of Track and Cross Country.

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TARR, CHARLES EDWIN (1968); B.S., University of North Carolina, 1961; Ph.D., 1966; Assistant Professor of Physics.

TASHJIAN, ROBERT JOHN; A.B., Clark University, 1951; V.M.D., University of Pennsylvania, 1956; Lecturer in Animal Sciences (The Animal Medical Center, New York City).

TATEM, DAVID (1965); B.A., Randolph-Macon College, 1942; M.A., Columbia University, 1946; Associate Professor of Classics.

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TOBEY, DONALD MARVIN (1969); B.S., Cornell University, 1964; M.S., University of Wisconsin, 1967; Assistant Professor of Agricultural and Resource Economics.

TODD, FRANK HAROLD (1946); B.S., Bowdoin, 1935; M.A., Maine, 1936; Associate Professor of Physics.

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TOOLE, JOHN WILLIAM (1959); A.B., Harvard, 1946; M.A., Maine, 1948; M.A., University of Illinois, 1951; Associate Professor of Mathematics.

TRAFFORD, DAVID WHITE (1947); B.A., Maine, 1939; M.A., Indiana University, 1940; Ph.D., 1947; Professor of History; Acting Chairman, Department of History.

TREDWELL, ROBERT FERTIG (1967); A.B., Oberlin College, 1955; Ph.D., Yale, 1960; Associate Professor and Chairman, Department of Philosophy.

TREFETHEN, JOSEPH MUZZY (1938); A.B., Colby, 1931; M.S., University of Illinois, 1932; Ph.D., Wisconsin, 1935; Professor of Geology, University of Maine, Portland.

TREVETT, MOODY FRANCIS (1946); B.S., Massachusetts State, 1929; M.S., 1940; Professor of Agronomy.

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†TRUBOV, HERMON (1962); B.F.A., Ohio University, 1947; M.A., Columbia University, 1948; Ph.D., Syracuse University, 1956; Associate Professor of Education.

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TUMARKIN, ANN WELSH (1969); A.B., Pembroke College, 1964; Assistant Professor of Anthropology.

TURNER, WALTER WEEKS (1947); B.S., Massachusetts Institute of Technology, 1947; M.S., 1947; P.E. (Maine); Professor of Electrical Engineering.

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VAN AMBURG, GEORGE EDWARD (1961); B.S., Portland University, 1956; Director of Student Center, University of Maine, Portland.

VAN DER HEIDE, LOUIS (1968); D.V.M., University of Utrecht; (Holland), 1958; Associate Professor of Animal and Veterinary Sciences.

VANGERMEERSCH, RICHARD GUSTAVE JEROME (1967); B.S.A., Bryant College,

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1959; M.S., University of Rhode Island, 1964; Assistant Professor of Accounting, College of Business Andmisitration.

VAN LUIK, JAMES MACNAUGHTON (1969); B.S., Hillsdale College, 1951; M.S., (in Library Science) Columbia University, 1955; Assistant Professor of Library Service.

VARNEY, RICHARD HARRISON (1963); B.S., Maine, 1938; Extension Agent (Washington County), Cooperative Extension Service.

VERMEL, PAUL (1968); Baccalaureat of Secondary Education, French Lycee, Paris, 1942; School of Higher Studies in Music, Paris, 1948; Adelbert W. Sprague Visiting Professor of Music.

VIGER, NORMAN JOHN (1966); B.S., Maine, 1966; Instructor in General Engineering.

VITRO, FRANK THOMAS (1969); B.S., Notre Dame, 1963; M.A., Boston College, 1966; Assistant Professor of Education.

VITZTHUM, AIMEE (1968); Licence es Lettres, University of Paris, 1954; (Diploma of Advanced Studies, 1960;) Certificate of Teaching Aptitude, 1965; Assistant Professor of French.

VOSE, PRESCOTT HALE (1950); B.S., Bowdoin, 1929; M.B.A., Harvard, 1931; Budget Officer.

VROOMAN, THEODORE HERBERT (1965); B.A., St. Lawrence University, 1942; M.Ed., 1947; Assistant Professor of Education.

WADE, EDWARD ALEXANDER (1962); A.B., San Diego State College, 1949; M.A., University of Oregon, 1952; Ph.D., University of Wisconsin, 1955; Associate Professor of Psychology.

WADLIN, GEORGE KNOWLTON, JR. (1948); B.S., Pennsylvania State, 1948; M.S., Maine, 1953; Ph.D., Carnegie Institute of Technology, 1959; P.E. (Maine); Professor of Civil Engineering.

WADSWORTH, RICHARD C.; A.B., Cornell University, 1926; M.D., University of Rochester School of Medicine and Dentistry, 1931; Lecturer in Medical Technology, Eastern Maine General Hospital, Bangor.

WAGNER, JAMES BURNHAM (1964); B.S., Alfred University, 1953; M.A., University of Utah, 1964; Instructor in Mathematics.

WAKELIN, EDMUND F. (1963); B.A., Dartmouth, 1939; District Recreational Specialist, Cooperative Extension Service.

WALKUP, MARY JO COLEMAN (1967); B.S., University of Houston, 1955; M.S., Springfield College, 1960; Ph.D., University of Iowa, 1966; Associate Professor of Physical Education, Women's Division.

WALLACE, IAN (1967); B.A., St. Peter's College, Oxford, 1965; M.A., Oxford (England), 1968; Assistant Professor of German.

WALLACE, ROBERT LOUIS (1966); B.S., Maine, 1954; M.Ed., 1961; Assistant Professor of Physical Education.

WARNE, EDMUND RUSSELL (1969); B.A., The University of Redlands (California), 1961; M.A., University of Washington, 1962; B.D., Yale Divinity School, 1965; Assistant Professor of Philosophy.

WARNER, MARDIS R. (1950-55) (1956); B.S., Ohio State, 1949; B.A.E., Ohio State, 1949; Agricultural Engineer, Cooperative Extension Service.

WATERHOUSE, RUTH ANNE (1969); B.A., Maine (Portland), 1968; M.A., Maine (Orono), 1969; Instructor in Sociology, University of Maine, Portland.

WATERS, HARRY JOSEPH (1963); B.B.A., Hofstra College, 1954; M.B.A., New York University, 1955; Ph.D., 1964; Professor of Business and Economics, University of Maine, Portland.

WAVE, HERBERT EDWIN (1967); B.S., Maine, 1952; M.S., Rutgers, 1960; Ph.D., 1961; Associate Professor of Plant and Soil Sciences.

WAYMOUTH, CHARITY; B.Sc., University of London, 1936; Ph.D., University of Aberdeen, 1944; Lecturer in Bacteriology (Jackson Laboratory).

WEATHERBEE, RITA ROSEIN; B.S., Simmons College, 1952; M.A., Maine, 1954; Part-time Instructor in Zoology.

WEBER, STEPHEN LEWIS (1969); B.A., Bowling Green State University, 1964; Assistant Professor of Philosophy.

WEBSTER, JAMES HOUGHTON (1969); B.A., Maine, 1959; M.A., Clark University, 1966; Assistant Professor of Finance, College of Business Administration.

WEBSTER, KARL SMITH (1965); B.S., Vermont, 1949; M.S., Pennsylvania State University, 1958; Associate Professor of Mechanical Engineering.

WELLS, WILLIAM CARL (1931-1945) (1947); B.A., Maine, 1931; Director of Residence and Dining Halls.

WENCE, MILFORD EDWARD (1937); B.A., State University of Iowa, 1933; M.A., 1934; Ph.D., 1937; Professor of English.

WEST, PAUL ALBERT (1968); Instructor, Technical Division, Department of Civil Engineering.

WESTERBERG, ARNOLD GEORGE (1964)); B.A. in Ed., Pennsylvania State College, 1933; Ed.M., Bates, 1943; Center Director, Continuing Education Division, (Lewiston-Auburn).

WESTERMAN, HAROLD SCOTT (1949); B.A., University of Michigan, 1946; Professor of Physical Education; Director of Physical Education and Athletics.

WESTFALL, CLAUDE ZEBEDEE (1954); B.S.F., West Virginia University, 1952; M.S., Maine, 1954; Associate Professor of General Engineering.

WHELDEN, HARRY CROSSMAN, JR. (1955); B.S., University of Connecticut, 1948; Poultry Specialist, Cooperative Extension Service.

WHITE, MARY LOU (1968); B.S. in Ed., University of Akron, 1955; M.S., University of Wisconsin, 1965; Assistant Professor of Education.

WHITE, PHILIP RODNEY; A.B., University of Montana, 1922; Ph.D., Johns Hopkins, 1928; Lecturer in Botany.

WHITEHILL, ALVIN RICHARD (1961); A.B., Dartmouth, 1937; Ph.D., Cornell University, 1942; Professor of Bacteriology.

WHITING, WILLIAM LAWRENCE (1947); B.A., Maine, 1937; M.Ed., Bates, 1948; M.A., Northwestern University, 1954; Associate Professor of Speech and Associate Dean, University of Maine, Portland.

WHITMAN, RUSSELL ALLEN (1968); B.A., San Jose State College, 1954; M.A., 1958; M.Ed., Oregon State University, 1964; Director, University Counseling and Testing Center; Assistant Professor of Education.

WHITMORE, ALLAN RICHARD (1969); B.A., Maine, 1962; M.A., Northwestern University, 1964; Assistant Professor of History, Division of Social Sciences, University of Maine, Portland.

WHITNEY, ALLISON INGALLS (1962); B.S., Maine, 1962; M.S., 1964; Assistant Professor of Electrical Engineering.

WHITNEY, HARRY F. (1955); B.S., Maine, 1954; M.S., Cornell University, 1955; Extension Agent (Waldo County), Cooperative Extension Service.

WHITNEY, JUDITH STEARNS; B.S., Maine, 1964; M.S., 1966; Part-time Instructor in Chemistry.

WHITTAKER, JAMES CURTISS (1968); B.S., Purdue University, 1958; M.S., 1960; Ph.D., Ohio State University, 1965; Assistant Professor of Forest Resources.

WICKS, ULRICH (1969); B.A., Northern illinois University (DeKalb), 1963; Instructor in English.

WIHRY, DAVID FRANCIS (1969); A.B., Merrimack College, 1964 Assistant Professor of Economics.

WIKSTROM, NELSON (1968); B.A., Northeastern University, 1963; M.A., The University of Connecticut, 1965; Ph.D., 1969; Assistant Professor of Political Science.

WILDES, GLENN K. (1958); B.S., University of Rhode Island, 1954; M.S., 1957; Area Dairy Specialist, Cooperative Extension Service.

WILLARD, NANCY LEE (1969); B.S .,Russell Sage, 1958; M.S. in Ed., Suce, Plattsburg, New York, 1967; Assistant Professor of Physical Education, University of Maine, Portland.

WILLIAMS, ROBERT B. (1964); B.S.A.E., University of Maine, 1957; M.S., 1965; Associate Professor of Agricultural Engineering, Agricultural Experiment Station.

WILSON, JAMES ALBERT (1968); B.A., Lake Forest College, 1962; Assistant Professor of Economics.

WILSON, JOHN ROBERT (1969); A.B., Bates College, 1963; M.A., University of Kansas, 1967; Instructor in English.

WILSON, NEVILLE (1969); B.A., Tufts University, 1965; Ph.D., Stanford University, 1968; Instructor in English, University of Maine, Portland.

WILSON, SARA CURTIS (1946); B.S., Farmington State Normal, 1938; Extension Agent (Washington County), Cooperative Extension Service.

WING, KENNETH EVERETT (1966); B.S., Cornell University, 1958; M.Ed., 1960; Ph.D., 1966; Associate Professor of Agricultural and Resource Economics.

WITTER, JOHN FRANKLIN (1932); B.S., Maryland, 1928; D.V.M., Michigan, 1932; Professor of Animal Pathology.

*WLODKOWSKI, ZINAIDA SAPANKEVYCH (1967); B.A., Windham College, 1964; M.A., New York University, 1965; Assistant Professor of Languages, University of Maine, Augusta.

WOHLGEMUTH, ANDREW RICHARDS (1969); A.B., University of Pennsylvania, 1959; M.A., Syracuse University, 1966; Assistant Professor of Mathematics.

WOLF, BARBARA BUCKLEY (1969); B.A., Grinnell College, 1946; M.A., State University of New York (Albany), 1967; Instructor in English, University of Maine, Portland.

WOLFHAGEN, HELEN JANE (1964); B.S., Willamette University, 1942; Ph.D., University of California (Berkeley), 1949; Instructor in Chemistry.

WOLFHAGEN, JAMES LANGDON (1952); A.B., Linfield College, 1946; Ph.D., University of California, 1951; Professor and Head, Department of Chemistry.

WOODARD, FRANKLIN EARL (1968); B.S., Maine, 1961; M.S., 1963; Ph.D., Purdue University, 1965; Assistant Professor of Civil Engineering.

WOODBURY, HAROLD MACE (1937); B.S., Maine, 1937; M.A., 1948; Professor of Physical Education; Head of Men's Division, Department of Physical Education and Athletics.

* On leave of absence, 1969-70.

WOODWARD, WALDA ALBION (1962); B.S., Maine, 1958; Extension Agent (Knox-Lincoln Counties), Cooperative Extension Service.

WOOTTON, ALBERT GEORGE (1956); B.S., Rutgers, 1931; M.A., Columbia, 1951; Professor of Mathematics.

WORK, GERALD GEORGE (1967); A.B., Albright College, 1960; M.Ed., Ohio University, 1962; Ph.D., 1967; Assistant Professor of Education.

WORRICK, ROBERT CLIFTON (1946); B.S., Maine, 1943; Director of Student Aid.

WRATTEN, CRAIG CHARLES (1966); B.S., Bethany College, 1960; M.S., University of Wisconsin, 1962; Ph.D., 1965; Assistant Professor of Biochemistry.

†WROTH, LAWRENCE KINVIN (1964); B.A., Yale University, 1954; LL.B., Harvard, 1960; Professor of Law, School of Law, Portland.

WYMAN, OSCAR LEWIS II (1965); B.S., Maine, 1949; M.S., University of Massachussetts, 1963; State Program Coordinator, Cooperative Extension Service.

YOUNG, DAVID BRUCE (1960); B.S., Duke University, 1955; M.S., 1959; Associate Professor of Electrical Engineering.

YOUNG, HAROLD EDLE (1948); B.S., Maine, 1937; M.F., Duke, 1946, Ph.D., 1948; Professor of Forest Resources.

YOUNG, SUSAN EVELYN (1965); B.S., Maine, 1963; Certified by American Dietetic Association, 1964; Instructor in Institutional Management, School of Home Economics.

ZABEL, LOWELL WALLACE (1967); B.A., Lawrence University, 1935; Louis Calder Professor of Chemical Engineering.

ZIEGENBEIN, DON RALPH (1964); B.S., Babson Institute, 1961; M.B.A., 1962; Assistant Professor of Finance, College of Business Administration.

ZIEMINSKI, STEFAN ANTONI (1954); Dipl. Ing. Technical University (Lwow, Poland), 1927; Doctor of Technical Science, 1929; P.E. (Maine); Professor of Chemical Engineering.

ZINK, MARY STILLMAN (1960); B.A., Cornell University, 1938; M.A., Yale University, 1955; Ph.D., Cornell University, 1960; Dean of Women; Professor of Education.

ZOLLITSCH, REINHARD (1964-1966) (1969); Philosophikum, University of Kiel, Germany, 1962; M.A., Maine, 1964; Instructor in German.

† On leave of absence, 1969-70.

Summary of Student Enrollment

1968-69

	Portland Campus			Orono Campus			Grand Total		
	Men	Women	Total	Men	Women	Total	Men	Women	Total
Graduates	—	—	—	489	149	638	489	149	638
Fifth Year	—	—	—	16	–	16	16	–	16
Seniors	139	88	227	827	571	1398	966	659	1625
Juniors	142	93	235	921	661	1582	1063	754	1817
Sophomores	172	123	295	952	767	1719	1124	890	2014
Freshmen	165	115	280	965	825	1790	1130	940	2070
Specials	30	25	55	93	79	172	123	104	227
Three-Year Nurses	—	—	—	1	53	54	1	53	54
Two-Year Courses:									
First Year	107	8	115	222	70	292	329	78	407
Second Year	83	17	100	168	27	195	251	44	295
Unclassified Degree Candidates	14	28	42	10	14	24	24	42	66
Audition	—	—	—	1	3	4	1	3	4
	852	497	1349	4665	3219	7884	5517	3716	9233
School of Law (Portland)									
First Year							53	3	56
Second Year							33	1	34
Third Year							29	—	29
Specials							2	—	2
Unclassified Degree Candidates							1	—	1
							118	4	122
Augusta Campus									
Two-Year Courses:									
First Year							87	50	137
Second Year							47	25	72
Unprogrammed Degree Candidates							4	1	5
Specials							31	15	46
Audit							1	—	1
							170	91	261
							5805	3811	9616
Summer Session							1977	2115	4092*
Grand Total (Omitting duplicates in Summer Session)							7237	5531	12768

* Includes classes held in Portland and other locations

Classification By Colleges

Graduates	—	—	—	489	149	638	489	149	638
Arts and Sciences	295	284	579	1332	1681	3013	1627	1965	3592
Business Admin.	407	39	446	509	39	548	916	78	994
Education	105	164	269	515	898	1413	620	1062	1682
Life Sciences and Agriculture	16	10	26	822	438	1260	838	448	1286
Technology	29	—	29	998	14	1012	1027	14	1041
	852	497	1349	4665	3219	7884	5517	3716	9233
School of Law							118	4	122
Augusta Campus							170	91	261
							5805	3811	9616

1968-69

Candidates For Degrees

	Portland Campus			Orono Campus			Grand Total		
	Men	Women	Total	Men	Women	Total	Men	Women	Total
Graduates	—	—	—	489	149	638	489	149	638
Arts and Sciences	278	267	545	1282	1585	2867	1560	1852	3412
Business Administration	399	39	438	504	38	542	903	77	980
Education	102	158	260	500	871	1371	602	1029	1631
Life Sciences and Agriculture	16	8	24	814	428	1242	830	436	1266
Technology	27	—	27	981	13	994	1008	13	1021
	822	472	1294	4570	3084	7654	5392	3556	8948
School of Law							116	4	120
Augusta Campus							138	76	214
							5646	3636	9282

CLASSIFICATION BY RESIDENCE

	Regular Session				Summer Session	Total
	School of Law	Augusta Campus	Portland Campus	Orono Campus		
Maine, by counties:						
Androscoggin	4	12	65	384	118	583
Aroostook	4	3	9	593	181	790
Cumberland	55	2	1014	714	600	2385
Franklin	1	2	3	115	19	140
Hancock	3	1	4	235	121	364
Kennebec	5	182	7	558	108	860
Knox	3	9	4	188	56	260
Lincoln	—	13	5	92	37	147
Oxford	1	9	20	251	51	332
Penobscot	1	1	8	1893	646	2549
Piscataquis	—	1	2	154	64	221
Sagadahoc	1	5	36	119	51	212
Somerset	—	15	3	243	80	341
Waldo	—	3	3	156	70	232
Washington	1	—	3	146	52	202
York	5	—	143	417	143	708
	84	258	1329	6258	2397	10326
Maine	84	258	1329	6258	2397	10326
Massachusetts	11	—	6	642	74	733
New York	2	—	2	214	140	358
New Jersey	—	—	1	288	49	278
Connecticut	9	2	1	136	46	194
New Hampshire	4	—	1	51	50	106
Pennsylvania	—	—	1	57	36	94
Vermont	10	—	—	35	19	64
Maryland	—	—	—	22	22	44
Virginia	—	—	—	29	14	43
Illinois	—	—	—	8	33	41
Ohio	—	—	—	17	21	38
Rhode Island	1	—	—	28	8	37
Florida	—	1	—	16	19	36
California	—	—	—	4	18	22
Michigan	—	—	—	4	18	22
District of Columbia	—	—	—	12	4	16
Wisconsin	1	—	—	5	10	16

CLASSIFICATION BY RESIDENCE, Continued

	Regular Session				Summer Session	Total
	School of Law	Augusta Campus	Portland Campus	Orono Campus		
Delaware	—	—	—	11	4	15
Indiana	—	—	—	3	11	14
Iowa	—	—	—	2	9	11
Missouri	—	—	—	4	7	11
Arizona	—	—	—	1	9	10
North Carolina	—	—	—	1	9	10
Georgia	—	—	—	1	8	9
West Virginia	—	—	—	1	7	8
Delaware	—	—	—	1	6	7
Minnesota	—	—	—	1	6	7
Texas	—	—	—	3	4	7
Colorado	—	—	—	1	4	5
Washington	—	—	—	2	3	5
Tennessee	—	—	—	2	2	4
Arkansas	—	—	—	—	3	3
Louisiana	—	—	—	2	1	3
Utah	—	—	—	1	2	3
Mississippi	—	—	—	—	2	2
Nebraska	—	—	—	1	1	2
Oklahoma	—	—	—	1	1	2
South Carolina	—	—	—	—	2	2
Kansas	—	—	—	—	1	1
Kentucky	—	—	—	—	1	1
Oregon	—	—	—	—	1	1
New Mexico	—	—	—	1	—	1
South Dakota	—	—	—	—	1	1
Wyoming	—	—	—	—	1	1
Canada	—	—	3	24	60	87
India	—	—	—	7	—	7
Brazil	—	—	—	5	—	5
Japan	—	—	—	4	1	5
Korea	—	—	2	2	—	4
Taiwan	—	—	—	4	—	4
China	—	—	—	3	—	3
Columbia	—	—	—	1	2	3
Ecuador	—	—	—	3	—	3

CLASSIFICATION BY RESIDENCE, Continued

			Regular Session		Summer Session	Total
			School of Law	Augusta Campus	Portland Campus	Orono Campus
France	—	—	—	2	1	3
Germany	—	—	—	3	—	3
England	—	—	2	—	—	2
Pakistan	—	—	—	2	—	2
Panama	—	—	—	2	—	2
Philippines	—	—	—	2	—	2
Puerto Rico	—	—	—	—	2	2
Thailand	—	—	—	2	—	2
Zambia	—	—	—	2	—	2
Chile	—	—	—	1	—	1
Egypt	—	—	—	1	—	1
Ethiopia	—	—	—	1	—	1
Greece	—	—	—	1	—	1
Iraq	—	—	—	1	—	1
Mexico	—	—	—	1	—	1
Netherlands	—	—	—	—	1	1
Nigeria	—	—	1	—	—	1
Portugal	—	—	—	1	—	1
Saudi Arabia	—	—	—	—	1	1
Spain	—	—	—	1	—	1
Turkey	—	—	—	1	—	1
Urganda	—	—	—	1	—	1
	122	261	1349	7884	3152	12768

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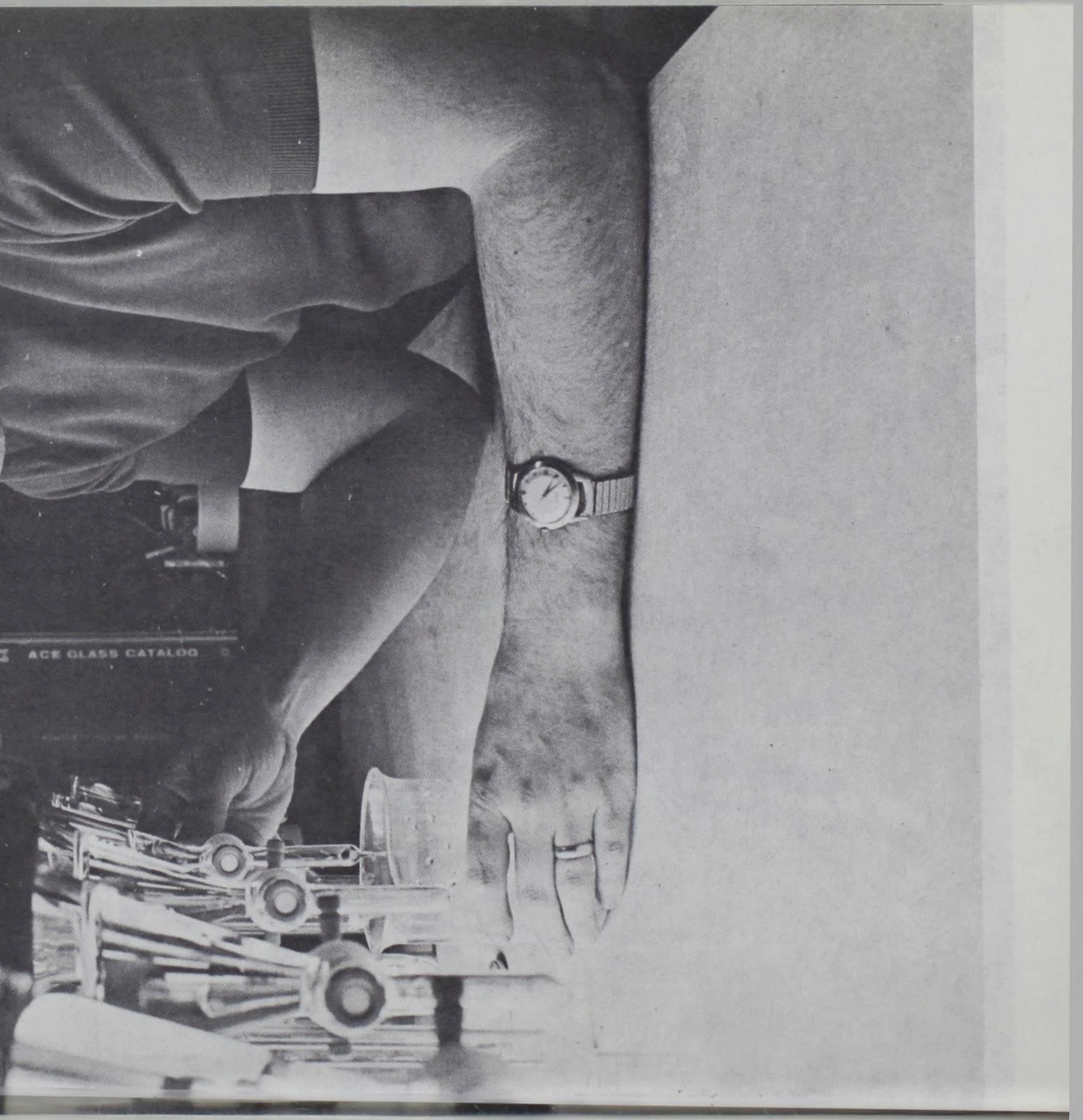
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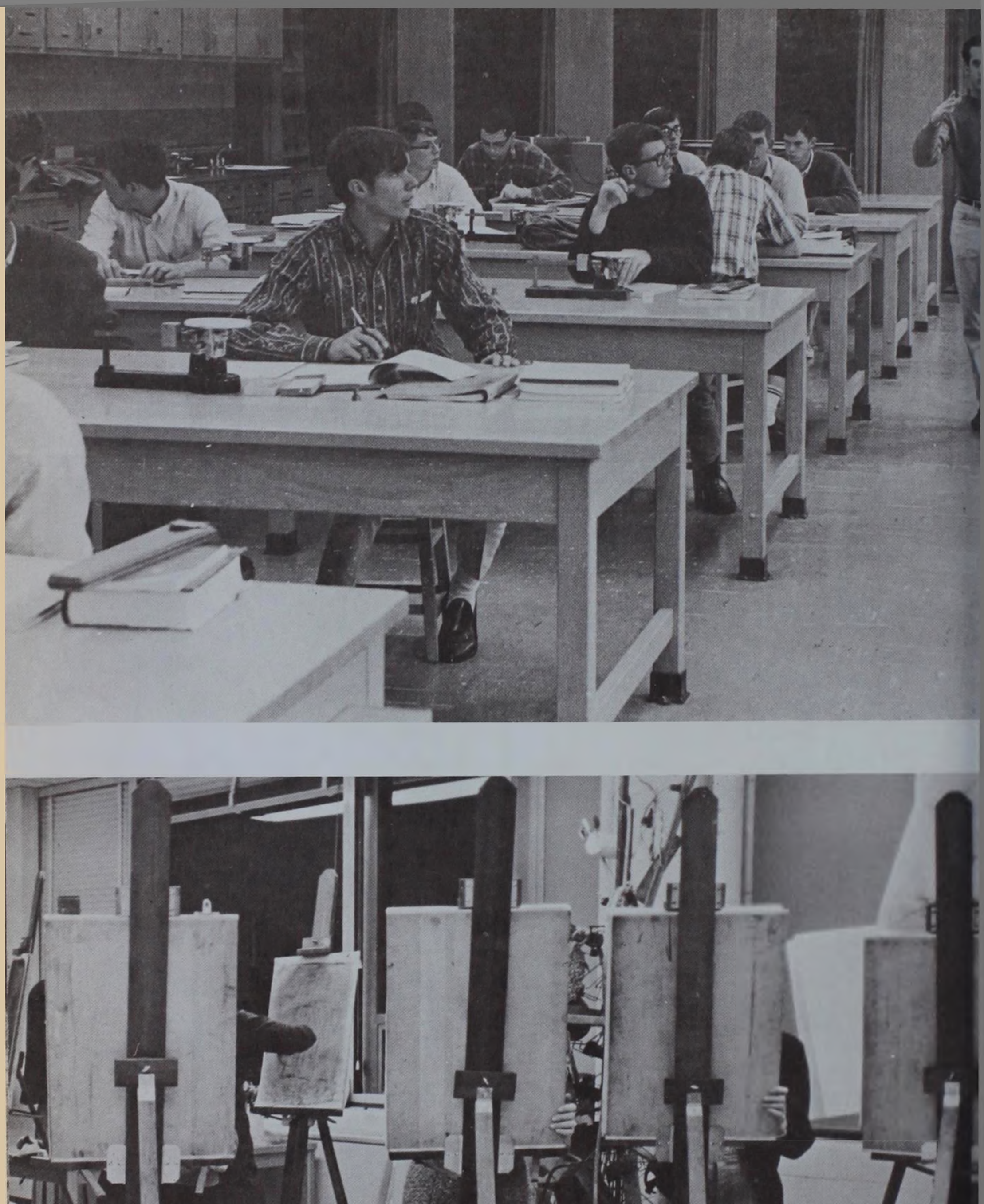
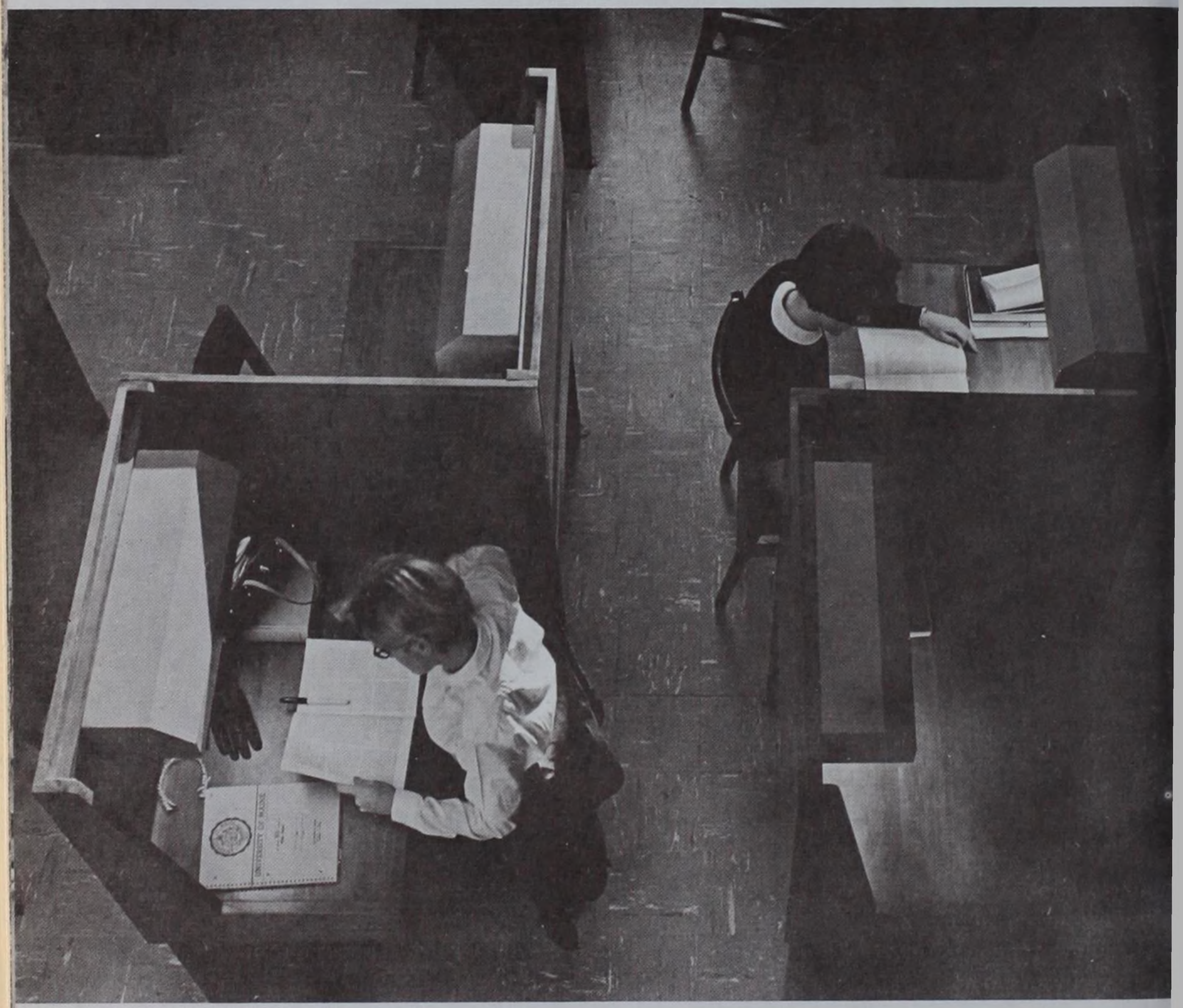


CONTENTS

UNIVERSITY OF MAINE, PORTLAND

DAVID R. FINK, PROVOST



General Information

The University of Maine, Portland, is a commuter campus which offers complete four-year programs leading to the degree of bachelor of arts for students majoring in biology, English, French, history, political science, mathematics, psychology, or sociology.

A four-year program that combines liberal arts and professional nursing education is offered by the School of Nursing. This program leads to the degree of bachelor of science. The first two years of the program consist largely of the general education courses tnat provide a foundation for the clinical courses of the junior and senior years.

Four-year programs leading to the degree of bachelor of science in business administration allow students to major in accounting, marketing, finance, or management.

There is also a two-year business program leading to the degree of associate in business administration.

In the engineering degree program, the first year is now available and a second year is being developed.

For prospective secondary teachers, the Portland campus offers complete four-year programs leading to the degree of bachelor of science in education and preparing graduates to teach high school courses in English, French, mathematics, or social studies.

For graduate students there are programs leading to the degrees of master of business administration, master of education, master of engineering, and master of library service. Credit in other graduate programs may also be pursued on the Portland campus.

The Continuing Education Division offers a wide variety of undergraduate and graduate courses on weekday evenings and Saturdays. Approximately 3,000 persons are registered for such courses on the Portland campus, with many more at centers in southwestern Maine under the direction of the Portland campus office.

C.E.D. also offers a number of non-credit courses, conferences ,and specialized programs of professional and general educational interest.

Summer Sessions provide further opportunities for students who wish to continue their studies during the summer months. In addition to C.E.D. courses in the evening, many three-week and six-week courses at both undergraduate and graduate levels are offered during the daytime throughout the summer.

Offices of the Cumberland County Extension staff and certain other specialists of the Cooperative Extension Service are located on the campus. In addition to regular Extension programs, the Cooperative Extension Service sponsors a number of non-credit short courses and seminars.

The faculty at the Portland campus is divided into five divisions:

Business and Economics: accounting, economics, finance, management, marketing, and subjects carried in the two-year business program.

Humanities: art, classics, modern languages, music, philosophy, and speech.

School of Nursing

Science and Mathematics: astronomy, the biological sciences, the earth sciences, the engineering sciences, chemistry, mathematics, physics, and psychology.

Social Sciences: education, history, political science, sociology, and social welfare.

This administrative innovation enables the student to recognize more fully the interrelationship of the various courses he studies. It also helps his instructors to keep in closer touch with the total learning experience of the individual student.

Applications for admission and all inquiries concerning admission to the University of Maine, Portland, should be addressed to the Director of Admissions, 96 Falmouth Street, Portland, Maine 04103. Application blanks should be filled out and returned promptly, together with the application fee of $10, which cannot be refunded, to the Director of Admissions. Information for veterans is available on the Portland campus from the office of the Registrar, Payson Smith Hall, 96 Falmouth Street, Portland, Maine 04103.

The same requirements for admission prevail at both the Orono and Portland campuses of the University.

Additional information concerning campus policy and activities is available through the Office of Student Affairs, 96 Falmouth Street, Portland, Maine 04103.

When a dash is used between the two numbers (e.g., 1–2), both semesters must be taken to obtain credit; when a slant is used (e.g., 1/2), the first semester may be taken by itself, but the second cannot be taken unless the first is taken previously; when a period is used (e.g., 1.2), either semester may be taken for credit.

The following abbreviations are used: Fresh—freshmen; Soph—sophomores; Jrs—juniors; Srs—seniors; per—permission; Cr.—credit. Courses listed in brackets ([ ])will not be offered in 1969-70.

BUSINESS AND ECONOMICS

JOHN W. BAY, Chairman
PROFESSORS SIEDLIK, WATERS; ASSOCIATE PROFESSORS BAY, DURGIN, FINDLAY, FITZPATRICK, HALL (ASSOCIATE DEGREE REPRESENTATIVE); ASSISTANT PROFESSORS ANDREWS, JAGOLINZER, MCKEIL, MCMAHON; INSTRUCTORS ANNETT, EMANUELSON, IMLAY, TAYLOR, VAN AMBURG; LECTURER PLOWMAN

Undergraduate Programs in Business and Economics

The primary objective of the undergraduate program in Business Administration is to develop the student's abilities to assume the responsibilities of business management. The program is aimed at providing the broad training necessary for successful business management in a rapidly changing economy. No attempt is made to provide detailed specialized training in particular business tasks. The program aims, rather, at developing skills and attitudes of mind that will enable the student to cope successfully with the change problems of business management in the years ahead. The program is implemented in three general phases: First, the student acquires broad training in the liberal arts and sciences for the necessary foundation upon which his future education will build. Second, the student pursues a program of study designed to provide him with an understanding of the major functional areas common to most business operations and with a knowledge of certain fields which are particularly relevant to the study of business management. This is referred to as the "core" program and includes basic courses in accounting, business data processing, economics, finance, the legal environment of business, marketing, and general management. Third, the student undertakes to acquire a deeper knowledge of the major field he has selected. This is accomplished by taking 15 credit hours beyond the introductory course in the chosen field.

The undergraduate program in economics is designed to prepare students broadly for careers in the civil service, law, management, public affairs, labor relations, and citizenship. Economics is a social science and as such must be studied in the perspective of a broad training in the liberal arts and sciences. Many students who plan to attend graduate and professional schools will find the undergraduate economics program to be valuable training for advanced academic work. Within the economics program, courses are available in such fields as: micro economic analysis, money and banking, macro economic analysis, history of economic thought, comparative economic systems, public finance, and the social control of business.

I. General Graduation Requirements

All students are required to complete 120 hours, exclusive of credit for basic military training.

In addition, each student must accumulate a total of "grade points" equal to 1.8 times the number of credit hours in which he receives grades. This grade point average is computed by multiplying each credit hour by a letter grade factor in the following manner: A hours by 4, B hours by 3, C hours by 2, D hours by 1, and E hours by 0.

All course work taken in Business (Ba) and Economics (Ec) must be completed with at least a 2.0 (C) average for a student to be eligible for a degree.

II. Requirements for a Bachelor of Science in Business Administration

A. General Foundation Subjects *(51 credits)*

1. Humanities and Fine Arts (21 credits)

   Eh 1/2 Freshman Composition
   Eh 19 Expository Writing
   Sh 1 Fundamentals of Public Speaking
   The remaining required courses may be selected in such fields as art, the classics, English composition, foreign languages, literature, music, philosophy, speech, and the theatre.

2. Social Sciences (15 credits)

   This requirement may be fulfilled by course work in such fields as anthropology, government, history, modern society, psychology and sociology. No course work in economics may be used to fulfill any part of this requirement.

3. Mathematics and Science (15 credits)
   Ms 13 Elementary Analysis
   Ms 14 Probability
   Ms 15 Analysis and Statistics
   Ms 16 Linear Systems
   And a science elective

B. Core Requirements in Business and Economics *(33 credits)*

Ec 1.2 Principles of Economics
Ec 168 Social Control of Business
Ba 9 Principles of Accounting I
Ba 10 Principles of Accounting II
Ba 23 Elements of Industrial Management
Ba 63 Marketing
Ba 130 The Legal Environment of Business
Ba 147 Business Data Processing*
Ba 149 Business Economics
Ba 151 Business Finance

* Ms 169 or another course may be substituted for Ba 147. In that event, the student must complete three additional hours in a Ba elective.

C. Major Field *(15 credits)*

1. Accounting Major

   Ba 41/42 Intermediate Accounting
   Ba 143 Advanced Accounting
   Ba 145 Cost Accounting
   Ba 148 Auditing

2. Business Administration Major

Ba 156 Investment Management
Ba 159 Business Management and Policy
Ba 170 Managerial Marketing
6 hours Business or Economics Electives

D. Electives *(21 hours)*

III. Requirements for a Bachelor of Science in Economics

A. General Foundation Subjects

1. Humanities and Fine Arts (15 credits)
Eh 1/2 Freshman Composition
Sh 1 Fundamentals of Public Speaking

A minimum of six additional credit hours must be taken in such fields as art, the classics, English composition, journalism, literature, music, philosophy, speech, and the theatre.

2. Social Sciences (12 credits)

Students must select at least 12 credit hours, including one full-year course, from the following list:

Ay 1/2 Introduction to Anthropology
Hy 3.4 United States History*
Hy 5.6 History of Western Europe*
My 1/2 Modern Society
Pol 1/2 Introduction to Government
Py 1/2 General Psychology
Sy 3/4 Introduction to Sociology

* Students may not select more than six hours of history to fulfill the 12-hour minimal requirement.

3. Mathematics and Science (15 credits)

Ms 13 Elementary Analysis
Ms 14 Probability
Ms 15 Analysis and Statistics
Ms 16 Linear Systems
And a science elective

B. Course Requirements in Economics and Business *(33 credits)*

1. Core Requirements:

Ec 1.2 Principles of Economics
Ec 132 Macro Economic Analysis
Ec 173 Micro Economic Analysis
Ba 9 Principles of Accounting I

2. Completion of at least 18 additional hours in economics (Ec) courses. However, no student will be granted degree credit for course work in business and economics in excess of 48 hours.

C. Electives (*45* CREDITS)

IV. Requirements for a Bachelor of Arts in Economics

A. ENGLISH AND SPEECH

Eh 1/2 Freshman Composition
Sh 1 Fundamentals of Public Speaking

B. FOREIGN LANGUAGE

The student must complete Intermediate French, German, Russian, Spanish, Greek, or Latin, or pass a qualifying exam in one of these languages.

C. SOCIAL SCIENCE

A minimum of two year-courses in social science is required of all students. Students who have not completed a basic one-year high school course in American History are required to take United States History (Hy 3.4). During the first two years, students who have completed such a course in high school should select two of the following year-courses:

Hy 3.4 United States History
Hy 5.6 History of Western Europe
My 1/2 Modern Society
Pol 1/2 Introduction to Government
Ay 1/2 Introduction to Anthropology
Sy 3/4 Introduction to Sociology
Py 1/2 General Psychology

Hy 3.4 and Hy 5.6 may not be used in combination to satisfy this requirement, and also Ay 1/2 and Sy 3/4 may not be used in combination to satisfy this requirement.

D. MATHEMATICS AND SCIENCE

Ms 13 Elementary Analysis
Ms 14 Probability
Ms 15 Analysis and Statistics
Ms 16 Linear Systems
And a science elective

E. HUMANITIES

A year-course from the following is required:

Hy 1.2 Classical and Medieval Civilization
Pl 1.2 Philosophy and Modern Life
Eh 15.16 Masterpieces of English and American Literature
Cl 1.2 Greek and Latin Literature in English Translation
Hr 47.48 Honors Group Tutorial for those students registered in the Honors Program

F. PHYSICAL EDUCATION

All students, except veterans, are required to take and pass one year of physical education.

G. Course Requirements in Economics and Business

1. Core Requirements:

   Ec 1.2 Principles of Economics
   Ec 132 Macro Economic Analysis
   Ec 173 Micro Economic Analysis
   Ba 9 Principles of Accounting I

2. Completion of at least 18 additional hours in economics (Ec) courses. However, no student will be granted degree credit for course work in business and economics in excess of 48 hours.

GRADUATE PROGRAM IN BUSINESS ADMINISTRATION

A graduate program le' ..ng to the degree of master of business administration is available during the evenings at the Portland campus.

All applicants for the M.B.A. program must submit scores obtained on the Admission Test for Graduate Study in Business which is administered by the Educational Testing Service, Princeton, New Jersey.

Candidates for the M.B.A. degree must complete a required core of 21 hours which consists of:

310. Management Policy
311. Managerial Economics
312. Managerial Accounting
313. Business Cycles and Forecasting
314. Financial Management
315. Marketing Management
316. Industrial Relations and Personnel Management

Nine hours of electives are required and must be selected from the following courses:

320. Market Research and Analysis
321. Human Relations in Industry
322. Operations Research
323. Production Management
324. Investment Management
325. Collective Bargaining
326. Organizational Behavior in Business
327. Business Logistics

Students who have had little or no undergraduate work in business and related subjects are required to supplement their formal degree program with additional background course work. Such students must earn or have earned the undergraduate credits, or their equivalents, stipulated: 9 semeste. hours in economics (at least one course beyond a full year in basic economics); 6 semester hours in accounting (at least one full year). The following credits may be either semester hours or quarter hours: 3 credits in management; 3 credits in finance; 3 credits in marketing; 3 credits in business law; and 3 credits in statistics.

For specific information concerning courses available in this program during any given semester, contact the Continuing Education Division, 100 Payson Smith Hall, 96 Falmouth Street, Portland.

UNIVERSITY OF MAINE

TWO-YEAR ASSOCIATE IN BUSINESS ADMINISTRATION PROGRAM

The University of Maine, Portland, offers a two-year curriculum providing technical academic work in the field of business administration.

This is a semi-professional terminal program designed primarily for students who wish to complete their education in two years. It is designed to give the student a working knowledge of business functions and methods.

While the program emphasizes business, it contains some courses in liberal studies such as English composition, report writing, and human relations. Many electives in the business areas are available for selection by the student according to his interests and desires.

Students admitted to the associate degree program at the University of Maine, Portland pursue the following curriculum during their two years:

First Year

FALL SEMESTER				SPRING SEMESTER			
		Subject	**Hours**			**Subject**	**Hours**
3	Ba	Business and Society	3	4	Ba	Business and Society	3
9	Ba	Principles of Accounting	3	10	Ba	Principles of Accounting	3
1	Ec	Principles of Economics	3	2	Ec	Principles of Economics	3
1	Eh	Freshman Composition	3	2	Eh	Freshman Composition	3
Pe	1	Physical Education	0	Pe	2	Physical Education	0
Elect one of the following:				Elect one of the following:			
1	Ba	Business Mathematics	3	2	Ba	Business Mathematics	3
Ms	13	Elementary Analysis	3	Ms	14	Probability	3
			15				15

Second Year

FALL SEMESTER				SPRING SEMESTER			
		Subject	**Hours**			**Subject**	**Hours**
23	Ba	Elements of Industrial Management	3	47	Ba	Business Data Processing	3
30	Ba	Legal Environment of Business	3	90	Ba	Problems of Small Business	3
63	Ba	Marketing	3	19	Eh	Expository Writing	3
91	Ba	Human Relations in Business	3	Elect one of the following:			
Elect one of the following:				66	Ba	Retailing	3
41	Ba	Intermediate Accounting	3	67	Ba	Sales Management	3
51	Ba	Business Finance	3	Elect one of the following:			
			15	42	Ba	Intermediate Accounting	3
				52	Ba	Business Finance	3
				56	Ba	Investment Strategy	3
							15

Upon completion of the 60-hour program with an accumulative grade point average of 1.8, a student will be awarded the degree of associate in business administration.

Graduates are equipped for employment at the junior management level in many fields of business. Some fields of business that graduates have entered are sales, retailing, banking, finance, and accounting. Students who qualitfy with high academic averages may, if they desire, continue their education by transferring

into the four-year program in Business Administration here or at other institutions.

Any high school graduate may apply for admission to the two-year program. A college preparatory course is not required. Applicants should complete the regular University of Maine application form and specify the Associate in Business Administration program. Candidates must also complete the College Entrance Examination Board's general Scholastic Aptitude Test and the Strong Vocational Interest Test.

ASSOCIATE DEGREE PROGRAM

1/2 Ba. Business Mathematics—The first semester introduces the student to the basic elements of algebra and geometry. The concepts of linear equations and systems are then developed which lead to the solution of business problems through the techniques of linear programming. Elements of the calculus and basic probability are then introduced as tools for business decision-making. *Cr* 3. (Students with sufficient secondary school background in mathematics may substitute Ms 13/14 Elements of College Mathematics for this course.) VAN AMBURG

3/4 Ba. Business and Society—An examination of the significant relationships between business and the social, political, and economic environment of our society for the purpose of evaluating goals, values, ethics, and practices in the business world. *Cr* 3. TAYLOR

9 Ba. Principles of Accounting I—An introduction to accounting principles and concepts. Emphasis on the preparation and interpretation of reports for financial and management uses and the accounting for assets, liabilities, revenues and expenses. *Cr* 3. MCKEIL

10 Ba. Principles of Accounting II—An introduction to the accounting for partnership, corporations and manufacturers. Emphasis on analysis and interpretation of accounting data and its use in management planning and control. Prerequisite: 9 Ba. *Cr* 3. MCKEIL

23 Ba. Elements of Industrial Management—A comprehensive survey of all phases of the management of industrial and business enterprises. The influence of industrial relations is interspersed with the treatment of management's technical problems. Prerequisite: Ec 1/2. *Cr* 3. ANNETT

30 Ba. The Legal Environment of Business—Examination of fundamental legal concepts and their application to the business community. Topics include the evolution of law, its underlying conceptual framework from which legal rules and principles of business develop. Selected legal cases will be critically analyzed and discussed. *Cr* 3. EMANUELSON

41/42 Ba. Intermediate Accounting—An intensive study of accounting theory, including asset valuation, depreciation theory, liability recognition, corporation equity measurement, determination of periodic income and revenue recognition. Prerequisite: 9, 10 Ba. *Cr* 3. HALL

47 Ba. Business Data Processing—The application of electronic data processing equipment to accounting systems. Basic principles of operation and programming. Selected case problems. Prerequisite: 9, 10 Ba. *Cr* 3. SIEDLIK

51/52 Ba. Business Finance—The first semester deals with the promotion, organization, and financing of the single proprietorship, partnership, and corporation. Students who elect to continue with the second semester will utilize advanced cases and problems related to the theory and principles developed in the first semester. The first semester may also be used as a prerequisite for 56 Ba Investment Strategy. Prerequisite: 1/2 Ec 9, 10 Ba. *Cr* 3. ANDREWS

56 Ba. Investment Management—Provides the planning and management of investment programs for all types of investors. Evaluates the various medias of investments in terms of their risks and profits. The functions of the stock market and its behavior is examined. Prerequisite: 1/2 Ec, 9, 10 Ba. *Cr* 3. ANDREWS

63 Ba. Marketing—Problems of distribution for representative industrial and consumer goods, including merchandising policies, selection of distribution channels, price policies, and advertising and sales promotion methods. Prerequisite: 1/2 Ec, 9 Ba. ANDREWS

66 Ba. Retailing—Study of the retail distribution structure and of the problems involved in successful store operation under current conditions. Prerequisite: 63 Ba. *Cr* 3.

67 Ba. Sales Management—Analysis of the problems facing marketing management in formulating sales policy and in managing the sales organization. Prerequisite: 63 Ba. *Cr* 3. TAYLOR

90 Ba. Problems of Small Business — Aspects of management that are uniquely important to small firms, in the interest of developing an understanding of the economic and social environment in which the small concern functions. Practice in decision-making on the same types of problems that small businessmen face. Problems relevant to small business operations in Maine will be stressed. Prerequisite· 9 Ba. *Cr* 3. ANNETT

91 Ba. Human Relations in Business — Introduction to the behavioral sciences, emphasizing typical behavioral problems faced in business by employees and management. The laboratory method of teaching, involving the student in role playing and analyzing collected data, is supplemented with lectures, case analysis, and outside reading. *Cr* 3. ANNETT

1/2 Ec. Principles of Economics—Analysis of the fundamental characteristics and institutions of modern economic society, including business and labor organization, national and international policies. *Cr* 3. MCKEIL

BUSINESS ADMINISTRATION

Ba 9. Principles of Accounting I—An introduction to accounting principles and concepts. Emphasis is placed on the preparation and interpretation of reports for financial and management uses and the accounting for assets, liabilities, revenues and expenses. *Cr* 3.

Ba 10. Principles of Accounting II—An introduction to the accounting for partnership, corporations and manufacturers. Emphasis is placed on analysis and interpretation of accounting data and its use in management planning and control. Prerequisite Ba 9. *Cr* 3.

Ba 23. Elements of Industrial Management—A comprehensive survey of all phases of the management of industrial and business enterprises. The influence of industrial relations is interspersed with the treatment of management's technical problems. Prerequisite: Ec 1.2 *Cr* 3. TAYLOR

Ba 41/42. Intermediate Accounting—An intensive study of accounting theory including asset valuation, depreciation theory, liability recognition, corporation equity measurement, determination of periodic income and revenue recognition. Prerequisite: Ba 9, 10. *Cr* 3. FINDLAY

Ba 63. Marketing—Problems of distribution for representative industrial and consumer goods, including merchandising policies, selection of distribution

channels, price policies, and advertising and sales promotion methods. Prerequisite: Ec 1.2 *Cr* 3. WATERS

Ba 76. Federal Tax Reporting—Federal tax laws as they affect individuals, partnerships, corporations, and estates. An opportunity is given the student to become familiar with tax forms. Prerequisite: Ba 9, 10. *Cr* 3.

Ba 130. The Legal Environment of Business—An examination of fundamental legal concepts and their application to the business community. Among the topics discussed are the evolution of law and its underlying conceptual framework from which legal rules and principles of business develop. Selected legal cases will be critically analyzed and discussed. (Juniors and seniors only.) *Cr* 3. JAGOLINZER

Ba 143. 144. Advanced Accounting—A study of accounting principles and theory related to: sources and application of funds; partnerships; consignment and installment sales; receiverships, estates, and trusts; governmental and institutional accounting; home office and branch accounting; consolidations, mergers, and parent and subsidiary accounting. Prerequisite: Ba 41/42. *Cr* 3. HALL

Ba 145/146. Cost Accounting—The principles and methods of job order costing and process costing, including analysis and allocation of factory overhead. A study of joint and by-product costs. Methods and management use of standard costs. Management decision making through cost-volume-profit analysis. Direct costing. Second semester devoted primarily to a detailed study of management uses of cost data. In addition budgets, forecasting and capital budgeting are discussed. Prerequisite: Ba 9, 10. *Cr* 3. JAGOLINZER

Ba 147. Business Data Processing—The application of electronic data processing equipment to accounting systems. Basic principles of operation and programming. Selected case problems. Prerequisite: Ba 9. *Cr* 3. SIEDLIK

Ba 148. Auditing—A study of auditing philosophy and theory relative to the examination of financial and other data. Internal control; auditing standards and procedures; and the legal and ethical responsibilities of the independent auditor. Prerequisite: Ba 41/42. *Cr* 3. FINDLAY

Ba 149. Business Economics—Application of economic analysis to concrete business situations. Emphasis on developing the student's ability to apply economic analysis to the solution of problems faced by business management. Prerequisite: Ba 151. *Cr* 3. DURGIN

Ba 151. Business Finance—This course deals with the promotion, organization, and financing of the single proprietorship, partnership, and corporation. It also utilizes advanced cases and problems related to the above topics. Prerequisite: Ec 1.2 and Ba 9/10. *Cr* 3. FITZPATRICK

Ba 156. Investment Management—Provides the planning and management of investment programs for all types of investors. Evaluates the various medias of investments in terms of their risks and profits. The functions of the stock market and its behavior is examined. Prerequisite: Ba 151. *Cr* 3. FITZPATRICK

[***Ba 157. Forward Planning and Capital Decisions***]—Basic financial forecasting and risk evaluation are combined with profit-volume-cost analysis as essentials in fully evaluating capital expenditure proposals. Cost of capital and other tools are developed for use in the decision-making process. Prerequisite: Ba 151. *Cr* 3. FITZPATRICK

Ba 159. Business Management and Policy—Administrative practice at the higher levels of business management through case analysis and discussion.

The course attempts to coordinate the background of business majors in the formulation and administration of sound business policy. Prerequisite: Ba 9/10, 23, 63. *Cr* 3.

Ba 161. Personnel Management—The selection, training, and management of personnel in private and public business. Designed for the student interested in administration, office management, or personnel work in education, business engineering, public service, and other fields. Prerequisite: Ec 1.2. *Cr* 3.

Ba 162. Industrial Relations—A study of industrial relations patterns in the U.S. Major focus is on the relationship between management and organized labor, and the bargaining, administration and interpretation of contracts. The problem of disputes settlement and a comparison of methods used in the U.S. and abroad. Attention is also given to industrial relations in unorganized firms and in the civil service. Prerequisite: Ec 133. *Cr* 3.

Ba 164. Dynamics of Organization and Behavior—An analysis of business organization and the problems of administrators in an interpersonal setting. Primary emphasis is on the findings of behavioral sciences which are particularly relevant to the management of economic enterprises. Also an examination of interdisciplinary approaches to human relations and adjustment problems in modern organizations. Motivation, leadership, and organization theory as related to work and productivity, and associated topics are also covered. Prerequisite: Ba 23. *Cr* 3.

Ba 165. Advertising—The place of advertising in the marketing program. Business cases are analyzed to determine those situations in which advertising may be profitably employed to stimulate primary and selective demand for industrial and consumer goods and services. Prerequisite: Ba 63. *Cr* 3.

Ba 167. Sales Management—An analysis of the problems facing marketing management in formulating sales policy and in managing the sales organization. Prerequisite: Ba 63. *Cr* 3.

Ba 169. Marketing Research—A consideration of marketing research as a tool in the solution of problems in production and distribution. Emphasis on problem formulation, exploratory research, research design, basic observational and sampling requirements, data analysis, interpretation, and sampling. Prerequisite: Ba 63 and Ms 19. *Cr* 3.

Ba 170. Managerial Marketing—A managerial approach emphasizing the integration of marketing, as an organic activity, with other activities of the business firm. Study is directed toward recognition and appreciation of the problems encountered by top marketing executives in modern business, with a consideration of the policies and procedures that may be followed in their solution. By case analysis and consideration of current marketing literature, students are provided opportunities for development of abilities in solving marketing management problems. Prerequisite: Ba 63 and Ms 19. *Cr* 3. WATERS

Ba 195. Financial Research Seminar—Techniques of research and analysis are introduced and applied to topical areas in finance, such as money, credit, banking and debt instruments. Prerequisites: Ba 151, Ec 153, Ms 19, and permission. *Cr* 3. FITZPATRICK

Ba 310. Management Policy—Administrative practice at the higher levels of business management. Coordinates the analysis of all pertinent business functions in specific case studies for the purpose of developing administrative competence in the formulation of business policy at the decision-making level. Prerequisite: 6 hours in business subjects and permission. *Cr* 3.

Ba 311. Managerial Economics—Application of economic analysis to the management of business enterprises. Designed to develop the student's ability to understand and use some of the important economic concepts, tools, and methods, relevant to operations and decisions within a business firm. Particular attention is given to the analysis of market demands, price policy, cost structures and production functions, capital budgeting, planning, and financing. Prerequisite: 9 semester hours in economics or permission. *Cr* 3. DURGIN

Ba 312. Managerial Accounting—Development, analysis, and interpretation of accounting data and financial statements for managerial control, coordination, and decision-making; emphasis upon accounting as a tool of management. Topics are developed by utilization of case studies, problems, and reference material. Prerequisite: 6 semester hours in accounting. *Cr* 3. FINDLAY

Ba 313. Business Cycles and Forecasting—An examination of cyclical movements in the level of economic activity and appropriate methods for their measurement. Includes an analysis of the principal theories of the forces that shape these fluctuations. Relates the statistical methods of forecasting activity in the major economic sectors to the planning function of management. Prerequisite: 6 semester hours in economics. *Cr* 3. BAY

Ba 314. Financial Management—A consideration of management decisions in the administration of corporate funds. Specific areas covered include capital budgeting, inventory control, working capital management, and the cost of capital. The side effects of taxation, depreciation methods, and earnings retention policies are noted. Current capital structure patterns are analyzed and evaluated. Prerequisite: One course in finance and permission. *Cr* 3. FITZPATRICK

Ba 315. Marketing Management—This course is concerned with developing an ability to analyze marketing problems while acquiring a positive attitude as to the role that marketing plays in overall business strategy. Emphasis given to the building of integrated marketing programs designed to implement the long-term objectives of a business organization. In general, the viewpoint emphasized will be that of the high level marketing executive. Prerequisite: One course in marketing and permission. *Cr* 3. WATERS

Ba 316. Industrial Relations and Personnel Management—A comprehensive investigation of the changing pattern of industrial relations in the United States. Major emphasis is on the human, social, and economic aspects of employer-employee relationships in both union and non-union settings. Provides an understanding of and appreciation for the crucial importance of the development of sound and flexible personnel policies by top management. Among the areas considered are: the changing nature of the labor force; wages, salaries and fringe benefits; hours of work; and the impact of technological change on the work force. Prerequisite· One course in management or industrial relations and permission. *Cr* 3.

Ba 320. Market Research and Analysis—A study of the procedure and applications of market research. Such areas as the organization and operation of a research department, survey methods, experimentation, measurement of potential demand and the analysis of distribution costs are considered. Emphasis on developing the student's ability to apply these and other techniques toward the solution of marketing problems. Prerequisite: Ba 315 and one course in statistics. *Cr* 3. WATERS

[***Ba 321. Human Relations in Industry***]—This course is designed to ac-

quaint the student with the complex system of interdependent human, social, technical, and organizational forces which underlie the feelings, actions, and relationships of people in organizations. Such subjects as leadership theory, organizational theory, individual and group behavior, and communication theory are presented. Prerequisite: 6 hours in business subjects and permission. *Cr* 3.

Ba 322. Operations Research—This course deals with the formulation and solution of optimization models for business decision making and economic resource allocation. Major emphasis on mathematical programming models, including linear programming fundamentals, simplex method, duality theory, sensitivity analysis and parametric programming in post-optimality analysis, goal programming, linear programming under uncertainty, dynamic programming, allocation problems (assignment, transportation models transportation simplex methods), network flows, integer programming, nonlinear programming, polygonal approximations, and gradient methods. Emphasis also on applications in accounting, finance, economics marketing, and production management. Prerequisite: One course in statistics and permission. *Cr* 3. SIEDLIK

[***Ba 323. Production Management***]—Decision models will be introduced with emphasis on statistical inference and decision theory, queueing theory, inventory theory, simulation, game theory, and Markovian decision models. Application areas include Product R & D investment models, capacity investment decision models, facility design models, line-balancing models, system maintenance models, and production system operating models. Prerequisite: Ba 322 or permission of instructor. *Cr* 3.

Ba 324. Investment Management—Emphasizes analysis and valuation procedures required to determine the investment quality of specific securities. Sets forth criteria for the formulation of a sound investment policy and the selection of investment media to implement it. Develops the techniques of continuing portfolio management and the task of periodic reappraisal. Prerequisite: One course in finance and permission. *Cr* 3. FITZPATRICK

Ba 325. Collective Bargaining—Discusses the major issues and problems in the collective bargaining process. Provides the business manager with the knowledge of sound collective bargaining attitudes and techniques necessary to achieve a responsible and mature attitude in his relationship with employee representatives. To this end, major focus is on the development of the union movement in this country, the changing nature of public policy toward collective bargaining and the public responsibility of both unions and management. In addition, attention is given to the specific tools of collective bargaining, including strikes, lockouts, grievance procedures, arbitration, mediation, and bargaining strategies and techniques. Prerequisite: Ba 316. *Cr* 3.

Ba 326. Organizational Behavior in Business—Emphasis on the importance of the influence process, motivational settings, and the structural backgrounds of organizational status and social relations. Analysis through case discussion and readings will develop a conceptual framework for improving individual decision-making ability with respect to individual, group, and intergroup problems. Prerequisite: One course in management and permission. *Cr* 3.

Ba 327. Business Logistics—Explores in depth the need for and means of centralization of decision-making to accomplish effective senior executive control of the chain of logistics activities from point of completion of manufacturing or other form utility creating process to delivery at the point of use or consumption. Inter-

discipline relationships with cybernetics, econometrics, operations research, computer-facilitated information analysis, purchasing (materials management) and the customer relations aspect of marketing (physical distribution) reviewed in their roles as logistics sub-systems or building blocks. Prerequisite: Ba 322 Operations Research or consent of the instructor. *Cr* 3. PLOWMAN

ECONOMICS

Ec 1. 2. Principles of Economics—Analysis of the fundamental characteristics and institutions of modern economic society, including business and labor organization, national and international policies. *Cr* 3.

Ec 37. Comparative Economic Systems—The structures and operating principles of the major contemporary economic systems are examined and compared. Prerequisite: Ec 1.2. *Cr* 3. DURGIN

Ec 38. The Economic System of the Soviet Union—A study of the development, institution, and structure of the Soviet economy. Emphasis on current theories and problems of central planning. Prerequisite: Ec 1.2. *Cr* 3. DURGIN

Ec 132. Macro Economic Analysis—An analysis of the basic forces that cause inflation, growth, and fluctuations in economic activity. The effects on employment, investment, and other factors are thoroughly treated. Stabilization policies are examined and evaluated. Prerequisite: Ec 1.2. *Cr* 3. BAY

[***Ec 133. Labor Economics***]—A discussion of labor in an industrial society serves as background for an examination of the origins and structure of the labor movement, the theories of the labor movement, the theories of wages and labor's income, the process of collective bargaining in industrial relations, and the development of labor legislation and social security laws. Prerequisite: Ec 1.2. *Cr* 3.

Ec 135. History of Economic Thought—A survey of the development of basic economic principles and theories from pre-industrial times to the present. Major emphasis is on the Classical School (Smith, Ricardo, and Malthus) and its critics, the development of the Austrian School, the synthesis of Neo-Classicism, and the emergence of Macro-economics. Prerequisite: Ec 1.2. *Cr* 3. DURGIN

Ec 138. Economic Development—The theories and practices of interregional and international economic development. Special attention is given to development problems of emerging nations. Prerequisite: Ec 1.2. *Cr* 3.

Ec 153. Money and Banking—An extensive examination of the operation and performance of the American banking and financial system. Includes a study of monetary theory and policy. Debt management and present international monetary problems are discussed briefly. Prerequisite: Ec 1.2. *Cr* 3. BAY

Ec 168. Social Control of Business—Public policy toward business; government powers and private rights; government aids; regulation of competition and monopoly; public enterprise. Prerequisite: Ec 1.2. *Cr* 3. DURGIN

Ec 171. Public Finance and Fiscal Policy — Public expediture theory; principles of taxation; the federal budget and alternative budget policies; federal tax policy; fiscal policy for stabilization; federal debt. Prerequisite: Ec 1.2. *Cr* 3. MCMAHON

Ec 172. State and Local Government Finance — Development of the federal system; fiscal performance; intergovernmental fiscal relations; state and local revenue systems; budgetary practices; state and local debt. Prerequisite: Ec 1.2. *Cr* 3. MCMAHON

Ec 173. Micro Economic Analysis — Price, income, and employment theory as tools in the study of economics. Prerequisite: Ec 1.2. *Cr* 3.

Ec 175. Industrial Organization—Emphasis on determining the relationship between market structure, conduct and performance. Also, the development of a general analytical framework to permit an assessment of performance in existing markets. Finally, current public policy in this area is evaluated in the framework of the above analysis. Prerequisite: Ec 173. *Cr* 3.

HUMANITIES

WILLIAM J. MACLEOD, CHAIRMAN

ART

ASSISTANT PROFESSOR BEARCE (DISCIPLINE REPRESENTATIVE);
INSTRUCTORS RAKOVAN, REID

Art is becoming more and more important as a significant resource for leisure time in a changing and mechanized world. The program is divided into studio work (basic and advanced in object, cast, and life drawing and painting) as well as a more academic study of history of architecture, painting and sculpture. The discipline also conducts a guided tour to the Boston Museum of Fine Arts twice a year.

Practical courses are held in modern well-equipped and lighted studios. In good weather the classes sometimes make excursions to Portland's waterfront, docks, fishing fleet and historic urban areas.

At 1. Basic Drawing — An introduction to academic drawing increasing the student's awareness of the elements of art-line, form, texture composition—with the use of charcoal, pencil, graphite, chalk, ink, wash and later watercolor. Work in the studio as well as outdoors. *Cr* 2.

At 2. Basic Drawing—A continuation of At 1 with the development of each student's individual facility and skill. Painting excursions to Portland's waterfront, docks, fishing fleet and nearby islands. Ink, watercolor, pastel. Prerequisite: At 1. *Cr* 2.

At 3. 4. Principles of Art—The basic principles of art—its substance, nature, and classifications. An analysis of architectural, sculptural and pictorial forms. Not a historic study of art, although masterpieces are studied. *Rec* 2, *Cr* 2.

At 5.6. Art Appreciation and History—Techniques and trends in architecture, sculpture, and painting as related to the history of art from the earliest times to the present day. Lectures, text, slides, and prints. *Rec* 3, *Cr* 3. REID

At 7. Design—Fundamentals of design through visual arts. Blockprinting, silk screening, posters. Two-dimensional design problems. *Cr* 2. RAKOVAN

At 8. Design—Fundamentals of design through the visual arts. Clay modeling, plaster casting, papier mache, wire sculpture. Three-dimensional design problems. *Cr* 2. RAKOVAN

At 9/10. Advanced Design—Advanced work in design problems, using design experiences introduced in basic course. Two- and three-dimensional problems applied to graphics, fabrics, sculpture, construction, etc. Prerequisite: At 1/2 or 7 and 8. *Lab* 4, *Cr* 2. BEARCE

At 11/12. Advanced Drawing—Advanced studies in form, space, composition, and cast drawing. Field trips for outdoor sketching and painting. Development from charcoal to watercolor painting. Prerequisite: At 1/2. *Lab* 4, *Cr* 2.
BEARCE

At 13. 14. Fundamentals of Painting — Basic introductior ·ɔ painting using various media. The study of color and composition in both studio and outdoor subjects. Prerequisite: At 1/2 or permission (not open to art majors). *Lab* 4, *Cr* 2.
RAKOVAN

At 15/16. Painting (for art majors)—Studio and outdoor study of composition, color, etc. Use of various media including pastel, ink, watercolor, gouache, oil and acrylic. Prerequisite: At 11/12. *Lab* 4, *Cr* 2. RAKOVAN

At 23. History of Modern Art—A study of the modern movements in Western art starting with the mid-ninteenth century to the present. Growth and development of the modern "isms". *Rec* 3, *Cr* 3. RAKOVAN

At 31. History and Appreciation of the Graphic Arts—An explanation of the graphic techniques: woodcut, engraving. etching, aquatint, lithograph, etc. A study of the graphic arts as they have evolved throughout the history of art with emphasis upon the important graphic artists of Europe, America, and the Orient. Exercise in the appreciation and understanding of the products of the graphic artist. *Rec* 3, *Cr* 3.

At 35. Printmaking-Intaglio—Introduction to intaglio printmaking using etching, engraving, aquatint, messotint, and drypoint. Prerequisite: At 1/2 or permission. *Lab* 4, *Cr* 3. BEARCE

At 69. The Teaching of Art — Current methods and materials for the teaching of art in the elementary grades. Theory and actual experience with various two- and three-dimensional art projects. *Cr* 3.

At 71. History of Architecture and the Urban Environment—A study of the European-American tradition of architectural design with emphasis upon the basic styles which influence American architecture and their utilization in urban America. Consideration of aesthetic and social interplay of architectural design throughout history, especially as it is manifest in urban design. *Rec* 3, *Cr* 3.

At 97. 98. Problems in Art—Advanced projects for student research and presentation. Undergraduate thesis or exhibition. *Cr Ar.* Permission of staff.

ENGLISH

PROFESSORS BERNARD, JACKSON; ASSOCIATE PROFESSORS COFFIN, JACQUES; ASSISTANT PROFESSORS BAIER, BURKE (DISCIPLINE REPRESENTATIVE), DUCLOS, LEWISOHN; INSTRUCTORS DALVET, MCKIBBEN, MILLIKEN, ROERDEN, WILSON, WOLF

English includes everything involved in the use of words from the simplest rote learning to attempts to sharpen awareness of both concrete experience and abstract meaning, all aiming at enhanced power and grace in the realms of taste and judgment. More specifically, English seeks to nourish the abilities to see and report accurately, to face and organize what is complex, and to make serious and humane decisions.

The requirements for the English major are these: Eh 3.4, 7 *or* 8, 43, and enough other English courses to total at least 36, but no more than 48, semester

hours. At least 9 hours must be selected from the following: Eh 57, 58, 153, 159, 160, 161, 164, 284.

Eh 1. 2. Freshman Composition—Intensive practice in expository writing, with reading of illustrative material. Required normally of freshmen. *Cr* 3.

Eh 3. 4. English Literature—Readings in the chief English authors in chronological order, with class discussion. First semester, from the beginnings to 1700; second semester, from 1700 to about 1918. *Cr* 3. JACKSON

Eh 6. Introduction to Literary Forms and Terms—Reading and discussion of literary types. A course intended primarily for prospective majors in English. Open to freshmen. *Cr* 3. LEWISOHN

Eh 7. 8. Advanced Composition—A course for those who wish to develop greater skill in writing, either for their own pleasure or for professional use. *Not* a remedial course. Prerequisite: Eh 1.2 (or equivalent of Eh 2); or, permission of instructor. *Cr* 3. BERNARD

Eh 9. 10. Modern Literature—Readings in significant literature of the last half-century. Primarily for freshmen. Others by permission only. *Cr* 3. BURKE

Eh 15. 16. Masterpieces of English and American Literature—An introduction to literary appreciation through the study of selected masterpieces. Recommended for non-majors who have not previously taken advanced courses in literature. *Cr* 3.

Eh 19. Expository Writing—Primarily for juniors and senior majors in Business Administration. Training in clear expository writing of formal reports, business communications, and related materials. *Cr* 2. JAQUES

Eh 41. Elementary Linguistics—The study of the structure of languages and the application of ideas of structure to the interpretation of literature. Recommended for English and language majors interested in teaching. *Cr* 3. COFFIN

Eh 43. American Literature—American literature through the 18th and 19th centuries, with emphasis on the principal writers. *Cr* 3. JAQUES

Eh 55. Poetry of the Romantic Movement — Wordsworth, Coleridge, Scott, Byron, Shelley, Keats and their contemporaries, against the background of their time. *Cr* 3. JACKSON

Eh 56. Victorian Poetry—Browning, Tennyson, Arnold, the Pre-Raphaelites and their contemporaries. *Cr* 3. WILSON

Eh 57. 58. Shakespeare—A survey of the comedies, history plays and tragedies. Attention is focused on the comedies and histories in the first semester, on the tragedies in the second semester. *Cr* 3. JACKSON

[***Eh 121. Modern Grammar***]—This course is particularly for prospective English teachers. It introduces traditional and modern grammars. *Cr* 3. COFFIN

Eh 145. Semantics—Interpretation of literature by means of analysis of the language used. Recommended for prospective teachers of literature and English. *Cr* 3. COFFIN

[***Eh 149. Introductory Linguistics***] — The student is introduced to the study of languages by means of the methods used for understanding the structure and meaning of language. *Cr* 3. COFFIN

Eh 153. Chaucer—Selections from the major poetry, with attention to the literary and historical background. *Cr* 3. BURKE, COFFIN

Eh 159. Elizabethan Prose and Verse—Major and representative non-dramatic writers, exclusive of Milton, in relation to their cultural background, 1557-1660. Prerequisite: Eh 3.4; or, permission of instructor. *Cr* 3. BERNARD

Eh 160. Seventeenth Century English Prose and Verse—Major and representative non-dramatic writers (exclusive of Milton) in relation to their cultural background, 1600-1660. *Cr* 3. BAIER

Eh 161. British Drama—Shakespeare's predecessors, contemporaries, and followers to 1642. Prerequisite: Eh 3.4; or, permission of instructor. *Cr* 3. BERNARD

Eh 164. Milton—The poetry and prose, with attention to the literary and historical background. *Cr* 3. BURKE

[***Eh 165. The Age of Dryden and Pope***]—Restoration literature (1660-1700) and the evolution of neo-classicism in the early 18th century. *Cr* 3.

[***Eh 166. The Age of Johnson***]—The later 18th century, especially Dr. Johnson and his circle, and the beginnings of Romanticism. *Cr* 3.

Eh 172. The New England Renaissance—The great writers of the United States in the mid-19th century, their works, personalities and social background. *Cr* 3. JAQUES

[***Eh 181. 182. The English Novel***]—The principal novelists from the beginning to Sir Walter Scott in the first semester. In the second semester, novelists from Jane Austen to Thomas Hardy. Prerequisite: Eh 3.4; or, permission of instructor. *Cr* 3. BERNARD

Eh 194. British Fiction—The best British fiction since 1900 with emphasis on contemporary writing. *Cr* 3. COFFIN

Eh 195. Twentieth Century British Poetry—The major poets of Great Britain and Ireland from 1900 to the present. Not open to those who have had Eh 45. Offered in Continuing Education programs only. *Cr* 3. LEWISOHN

Eh 196. Twentieth Century American Poetry—The major poets of the United States from 1900 to the present. Not open to those who have had Eh 46. Offered in Continuing Education program only. *Cr* 3. LEWISOHN

Eh 241. 242. Linguistics—Analysis of various language principles to provide an understanding of grammar and language arts. Recommended for English and language teachers or prospective teachers. Eh 242 will *not* be offered 1969-70. *Cr* 3. COFFIN

Eh 391. Sixteenth-Century Topics—*Cr* 3. BERNARD

[***Eh 396. Seminar in Linguistics and Semantics***]—*Cr* 3. BERNARD, COFFIN

[***Eh 399. Graduate Thesis***]—*Cr Ar.* STAFF

COMPARATIVE LITERATURE

Cp 91. Early 20th Century Drama of the Western World—A study of such major dramatists as Ibsen, Strindberg, Chekhov, Pirandello, Shaw and O'Casey. *Cr* 3. DUCLOS

Cp 92. 20th Century Drama of the Western World—A study of such major dramatists as Brecht, Anouilh, Giraudoux, Williams, Miller, and Albee, and the Theatre of the Absurd, with Beckett, Ionesco, Genet, Pinter, etc. *Cr* 3. DUCLOS

Cp 140. The English Bible—The English Bible studied as one of the masterpieces of English literature. Prerequisite: Eh 3.4 or 15.16; or, permission of instructor. *Cr* 3. BERNARD

[***Cp 151. Epic Masterpieces of the Middle Ages***]—The *Nibelungenlied, Beowulf, Chanson de Roland,* and the *Cid* will be studied, with attention also paid to legendary material of Celtic origin. Prerequisite: Eh 3.4 or 15.16; or, Fr 5/6

or 57.58; or, Sp 3/4 or 57.58; or, Gm 3/4 or 57.58; or Ru 3.4; or, permission of instructor. *Cr* 3. BERNARD

Cp 175. 176. European Literature—Continental Western European literature in translation. From Homer to Dante in the first semester, continuing to the present in the second semester. Recommended for majors in history or a foreign language, and for students preparing for library work. Prerequisite: Eh 3.4 or 15.16; or Fr 5/6 or 57.58; or Sp 3/4 or 57.58; or Gm 3/4 or 57.58; or, permission of instructor. *Cr* 3. BERNARD

Cp 187. Oriental and Primitive Masterpieces — The course starts with primitive literature of Black Africa and the American Indian and continues to early epic and other literature of Egypt, Babylonia, and Israel. *Cr* 3. COFFIN

Cp 188. Oriental and Oceanic Masterpieces—The course introduces the best of Chinese lyrical poetry and the spiritual epics of India. Related material of interest will be used from Tibet and Oceania. *Cr* 3. COFFIN

Cp 390. Renaissance Topics—*Cr* 3. BERNARD

Cp 391. Topics of Romanticism—*Cr* 3. BERNARD

Cp 392. Special Studies—*Cr* 3. BERNARD

FOREIGN LANGUAGE AND CLASSICS

ASSOCIATE PROFESSORS CLARK, F. SCHWANAUER; ASSISTANT PROFESSORS CASSOL, DALVET (DISCIPLINE REPRESENTATIVE), G. DUCLOS, HALPERIN (ON LEAVE), LEPELLEY; INSTRUCTORS HEMOND, ROLFE, J. SCHWANAUER

The curriculum is designed to develop skill in reading, writing, speaking and listening comprehension in the foreign languages and to offer an initiation to the corresponding cultures and literatures. The language laboratory is an important adjunct to the study of the modern languages.

At the present time the discipline offers a major only in French. The student must take a minimum of 24 hours above the level of French 3/4, of which at least 18 hours must be in literature courses on the 100 level. European History (Hy 5.6) is required of all French majors, Fl 166 of those who plan to teach; Fr 157/158 is strongly recommended for all. Students should also choose elective courses in the liberal arts and in history. They are encouraged to study a second language, modern or classical, and to plan a trip to a French-speaking country either as a junior year abroad or after graduation.

Cl 1. 2. Greek and Latin Literature in English Translation—In the first semester, epic and lyric poetry; in the second semester, drama and history. No knowledge of Greek or Latin is necessary. *Cr* 3. DUCLOS

Fr 1-2. Elementary French—Beginner's course in French. Initiation in the four skills of language learning: listening comprehension, speaking, reading and writing. Four weekly hours of classwork and one of laboratory practice. *Cr* 4. CASSOL

Fr 3/4. Intermediate French—For students who have completed Fr 1-2 or have reached equivalent proficiency in the language. Review of grammar. Classroom and laboratory practice aiming at fluency in speaking and reading. Three weekly hours of class and one of laboratory work. *Cr* 3.

Fr 7/8. Practical French — Systematic training in correct pronunciation and usage, and in vocabulary building, with written and oral practice, phonetics and work in the laboratory. Prerequisite: Fr 4, Fr 6, or the equivalent. Well-

qualified students who have not taken Fr 7 may with permission elect Fr 8. *Cr* 3. LEPELLEY

Fr 3a. 4a. Supplementary Oral French—For students needing oral practice. This course which meets only once a week may be taken in conjunction with Fr 3/4. *Cr* 1. CASSOL

Fr 109. 110. Introduction to French Literature — Reading and discussion of representative works of major periods in French literature from the Middle Ages to the present, and of the major genres (novel, drama, poetry). Techniques of close reading and *explication de texte* will be studied. Designed to give a general background for the major as well as provide a representative sampling for a nonmajor. *Cr* 3. DALVET

Fr 153. The French Novel from the First World War to the Present— Readings from Proust, Malraux, Camus, Robbe-Grillet and others. *Cr* 3. HALPERIN

Fr 154. French Theatre in the Twentieth Century — Readings from Giraudoux, Anouilh, Sartre, Camus, Ionesco and others. *Cr* 3. HALPERIN

Fr 157/158. French Civilization — A survey of the major periods of French civilization. The political and economic events are considered as well as the movements of philosophy, literature, music, and the visual arts. Open to students who have completed Fr 4 or the equivalent. Given in French. *Cr* 3. CASSOL

Fr 167. 168. Advanced Grammar and Stylistics—Designed to provide an adequate foundation in French grammar and syntax for prospective teachers. *Cr* 3. CLARK

Fr 171. 172. The Classical Age—Corneille, Racine, Molière, Pascal, La Fontaine and other representative authors. Prerequisite: Fr 109, 110 or the equivalent. *Cr* 3. LEPELLEY

Fr 173/174. XVIIIth Century: The Enlightenment in French Literature — Works of Montesquieu, Voltaire, Diderot, Rousseau are studied for the originality of their ideas and forms. Prerequisite: Fr 109, 110 or the equivalent. *Cr* 3. CASSOL

Gm 1-2. Elementary German — Emphasis on development of listening comprehension, speaking, reading, and writing skills. Laboratory practice. For students who have had no German or less than two years of high school German. *Cr* 4.

Gm 3/4. Intermediate German—Continuation of 1-2. Laboratory practice. For students who have completed German 1-2 or have completed two or three years of high school German. Completion of this course fulfills the language generalization requirement. *Cr* 3.

Gm 7/8. Practical German — Systematic training in correct pronunciation and usage, and in vocabulary building, with written and oral practice, and work in the laboratory. Prerequisite: Gm 4, or the equivalent. Well-qualified students who have not taken Gm 7 may with permission elect Gm 8. *Cr* 3.

Gm 109. 110. Readings in German Literature — A survey of the important periods in German literature with readings of representative works. Prerequisite: Gm 4 or the equivalent. This course, which is required of students majoring in German, should be taken in the junior year or earlier if possible. *Cr* 3.

[***Lt 3/4. Intermediate Latin***]—Selected reading in prose and poetry. For students who have had at least two years of high school Latin. *Cr* 3. DUCLOS

Lt 9. 10. Readings in Latin Literature — Reading in the prose and poetry of the Late Republic and Early Empire, with emphasis upon literary value. *Cr* 3. DUCLOS

Sp 1-2. Elementary Spanish — Emphasis on development of listening comprehension, speaking, reading, and writing skills. Laboratory practice. For students who have had no Spanish or less than two years of high school Spanish. *Cr* 4. CLARK

Sp 3/4. Intermediate Spanish—Continuation of 1-2. Laboratory practice. For students who have completed Spanish 1-2 or who have completed two or three years of high school Spanish. Completion of this course fulfills the language generalization requirement. *Cr* 3. HERNANDEZ

Sp 7/8. Practical Spanish—Systematic training in correct pronunciation and usage, and in vocabulary building, with written and oral practice, phonetics and work in the laboratory. Prerequisite: Sp 4, or the equivalent. Well-qualified students who have not taken Sp 7 may with permission elect Sp 8. *Cr* 3.

Sp 109. 110. Readings in Spanish Literature—A survey of the important periods and trends in Spanish literature with readings of representative works. For students who wish further practice in reading before beginning more advanced literature courses. *Cr* 3. HERNANDEZ

MUSIC

ASSOCIATE PROFESSOR NEWMAN (DISCIPLINE REPRESENTATIVE)
INSTRUCTORS BRYANT, GRANT, PERAZZI

At present basic music appreciation courses are offered in music. In addition, a student may participate in the chorus which meets once a week for two hours. This course may be taken for an hour credit each semester. There is no limit to the number of semesters the student may receive credit.

Plans are being formed to expand the music offerings further as rapidly as feasible.

Mc 01. 02. University Singers — Rehearsal and performance of choral concert repertoire. Membership through audition requires sight reading ability. Before requesting an audition the student should take the Music Fundamntals Test (See Secretary of the Department of Music). Four hours of rehearsal a week. Attendance at all rehearsals and public performances required. May be repeated for credit. *Lab* 4, *Cr* 1. BRYANT

Mc E 1. Music Methods for the Elementary Teacher — A functional course covering the methods, content, and materials of the elementary music program. Prerequisite: Mc L 1, and Mc T 1 or equivalent. *Cr* 3. GRANT

Mc H 1/2. History of Music—The history of music from antiquity to the present day with a technical study of the significant musical trends. Prerequisite: For the major, Mc L 22, or sophomore standing. For the general student, permission of the instructor. *Cr* 3. GRANT

Mc L 1. Understanding Music—A study of the basic elements of music necessary for intelligent listening. Emphasis on the various historical movements, together with a study of the great composers and their contrasting styles as exemplified by their most important compositions. For the general student. *Cr* 3. GRANT

Mc T 1. Fundamentals of Music—Notation and terminology, scales and intervals, chords, ear training, elementary rhythmic and melodic dictation, sight-singing. Open to all students. Required of music majors at no credit for those failing to pass the Music Fundamentals Test. *Cr* 3. PERAZZI

PHILOSOPHY

PROFESSORS MACLEOD, SWEIGART; INSTRUCTORS GAVIN (DISCIPLINE REPRESENTATIVE), MACKENSEN

The Greeks called philosophy the love of wisdom. Traditionally its subject matter has consisted of five general areas: logic—the techniques for sound reasoning, both deductive and inductive; epistemology—the different kinds of knowledge, truth and justification; ethics—comparative analysis of various moral concepts and viewpoints; aesthetics—the nature of art and artistic experiences; and metaphysics—the study of what constitutes reality and the nature of existence.

Philosophy develops methods of critical inquiry through the student's rigorously considering and discussing such questions as:

(1) What are the principles that distinguish valid from invalid reasoning?
(2) How does man know and how far can knowledge extend?
(3) What do we mean by a just act or a good life?
(4) What is art—is beauty only in the eye of the beholder?
(5) What is the difference between appearance and reality?
(6) Does God really exist?

There is not yet a major program in philosophy here, though practically all of the courses toward a major are now available, some through alternative year offerings. The introductory courses, which can be taken independently of each other, consist of Philosophy and Modern Life, Introductory Logic, Ethics, and Ancient Philosophy. However, it is preferable for students to start with the first-mentioned one.

Pl 1/2. Philosophy and Modern Life—An introduction to man's philosophical dimension, this two-semester course points out the importance of the questions a man asks, rather than the particular answers he gives to them. In the first semester, the problems of knowledge and reality are investigated, in an attempt to come to grips with the question: "How do I know that I know anything for sure?" In the second semester, the questions of morality and religion are taken up in detail, and an attempt is made to relate these to the problem of "knowing anything for sure." Primarily for freshmen and sophomores. *Cr* 3.

Pl 15. Our Religious Heritage—A descriptive study of the historical and contemporary expressions of the Hebrew-Christian tradition. *Cr* 2. RABBI SKY

Pl 17. Religions of the East — Hinduism, Buddhism, Confucianism, Taoism, Shinto, and Islam—their founders, scriptures, modes of worship, and ethics. *Cr* 2. RABBI SKY

Pl 116. Philosophy of Religion—Analysis of the nature of religious experience, knowledge, and language. Special attention given to fundamental problems, classical and contemporary, exhibited in religious experience and pertaining to areas of common concern in the sciences, the humanities, and philosophy. Sophomore standing or consent of instructor. *Cr* 3. MACLEOD

Pl 133. Aesthetics—An extended inquiry into the question of whether the aesthetic experience is intelligible or emotional, or both. Various theories and interpretations, classic and contemporary, of the nature of beauty, feeling, and the arts are studied. Prerequisite: Pl 1/2 or consent of instructor. *Cr* 3. GAVIN

Pl 135. Ethics—An introductory inquiry into problems of the good life and of right and wrong action. Classical moral theories are examined and discussed in the light of contemporary ethical issues. Sophomore standing or consent of instructor. *Cr* 3. MACLEOD

Pl 136. Introductory Logic—The relations of logic and language, of symbols and meanings. The principles and techniques of deductive and inductive reasoning. Prerequisite for Pl 136: sophomore standing or consent of instructor. *Cr* 3.
SWEIGART

[***Pl 137. Symbolic Logic***]—Study of techniques of modern deductive logic. the properties of formal systems, and the logical implications and paradoxes of language. Prerequisite: Pl 136 or consent of instructor. *Cr* 3. SWEIGART

[***Pl 140. American Thought***]—A brief examination of colonial and early 19th century American contributions to the development of present-day philosophy. Particular emphasis will be given to the philosophical views of Emerson, Royce, Peirce, James, and Dewey. Prerequisite: sophomore standing. *Cr* 3. GAVIN

[***Pl 150. Philosophy of History***]—A critical examination of the problem of historical knowledge, and of major speculative contributions to the interpretation of history. Readings include Hegel, Marx, Spengler, and Toynbee. Prerequisite: sophomore standing. *Cr* 3.

[***Pl 151. History and Philosophy of Science***]—A critical examination of the conceptual and experimental procedures scientists employ in formulating and evaluating their theories. In the first part of the semester, an historical analysis of key scientific procedures from the Pre-Socratics to Einstein is undertaken. The latter part of the semester concentrates on the relationship between facts, laws, and theories in contemporary scientific paradigms. Prerequisite: Pl 1/2 or consent of instructor. *Cr* 3. GAVIN

[***Pl 155. Ancient Philosophy***]—From the earliest Greeks through the Romans, with central emphasis on Plato and Aristotle, and including the Epicureans and Stoics. *Cr* 3.

[***Pl 156. Mediaeval Philosophy***]—The development of thought from the confluence of Greco-Roman philosophy with the Judaic, Christian, and Islamic traditions to the philosophies of the High Middle Ages. *Cr* 3.

[***Pl 157. Early Modern Philosophy***]—The emergence of rationalism and empiricism on the continent and in the British Isles. A study of representative chief thinkers from Descartes and Bacon to Hume. *Cr* 3.

[***Pl 158. Late Modern Philosophy***]—The philosophy of Kant and later idealism and other representative philosophers such as Comte, Mill, and Spencer in the 19th century. *Cr* 3. STAFF

Pl 165a. Topics in Philosophy—A seminar study of current theories and conflicts in the areas of values and ethics. For spring semester of 1969-1970. Prerequisite: Pl 2 or Pl 135 or consent of instructor. *Cr* 3. SWEIGART

Pl 165/166. Topics in Philosophy—Stressing individual and small group study of problems or systems of philosophical concern, this course is conducted in seminar style. The topic for the fall semester (1969-1970) is: William James—Psychology and Philosophy, and will consist of an intensive examination of James' theory of creative preception, as found in the Principles of Psychology. The topic for the second semester is: James' Aesthetics, Epistemology, and Metaphysics, which will attempt to show that the aesthetic notion of man as a sculptor (homo faber) permeates the entire Jamesian corpus. Pl 1/2 or consent of instructor. *Cr* 3. GAVIN

Pl 175/176. Philosophical Classics—An intensive study of the works of a major philosopher or school, conducted in seminar style. The subject for the fall semester (1969-1970) is: Nineteenth Century Philosophy. Specifically, the

epistemological influence of Kant on Schopenhauer, Hegel, and Nietzsche will be traced. The second semester's subject is: Nietzsche, and will treat in detail the metaphysics. aesthetics, and ethics of this philosopher. Pl 1/2 or consent of instructor. *Cr* 3. F. SCHWANAUER

SPEECH

ASSOCIATE PROFESSORS HANSEN (DISCIPLINE REPRESENTATIVE), WHITING; ASSISTANT PROFESSOR STEELE; INSTRUCTOR POWER

Speech is not presently a major, but basic courses in the areas of Public Speaking, Interpretation and Theatre are currently offered.

The aims of the curriculum are: to improve individual speech habits, leading to general improvement in oral communication; to train teachers of speech or those who are responsible for the direction of speech activities; to train people for certain professions (such as theatre and broadcasting) depending on the use of the voice; usually last to be considered is the part played by speech in a broad liberal education. Within the speech field the more theoretical aspects of the curriculum (such as theory and history of the theatre, and history and theory of public address), provide the liberal aspects of education in terms of speech areas, and lend themselves most easily to integration with other areas.

Sh 1. Fundamentals of Public Speaking—An analysis of the problems of the beginning speaker, with emphasis on the selection and arrangement of material, audience analysis, and delivery. Classroom experience in the preparation and delivery of short speeches. *Cr* 3.

Sh 11. The Contemporary Theatre—A critical examination of the state of the modern theatre, with emphasis on aesthetics. Includes correlation with the other arts. *Cr* 3.

Sh 16. Play Production—An introduction to the responsibilities of the director and to the basic principles of stage directing, including choosing and analyzing plays, scheduling rehearsals, blocking action, and determining stage business. Backstage work on major and laboratory theatre productions will be required. *Cr* 3. POWER

Sh 17. Fundamentals of Acting—The basic skills of acting, including the actor's internal preparation for playing a role and the development of his external techniques for projecting the role to his audience. *Lec* 2, *Lab* 2, *Cr* 3.

Sh 41. Fundamentals of Interpretation—An introduction to the art of interpretation to stimulate an understanding and responsiveness to literature and to develop the ability to convey to others, through oral reading, and appreciation of that literature. *Cr* 3.

Sh 166. Stage Directing—Theory and practice in the staging of plays. *Cr* 3.

Sh 169. Theatre Laboratory—Advanced laboratory work in the divisions of designing, lighting, or directing. The student may register, in different semesters, for credit in each of the divisions. Prerequisite: in designing, Sh 163 and permission; in lighting, Sh 164 and permission; and in directing, Sh 166 and permission. *Cr* 2.

SCHOOL OF NURSING

MARY ANN EELLS, DIRECTOR; PROFESSOR MACLEAN; ASSOCIATE PROFESSOR IVANISIN; ASSISTANT PROFESSORS CAMPBELL, COTTON, HAMILTON, JENSEN, ROSCOE, TRYON; INSTRUCTORS DUBOWICK, EDWARDS, ELLIS, FISH, HAMMOND, MADDOX, STONE AND TALBOT

The School of Nursing, established in 1958, offers a four-year program that combines liberal arts and professional nursing education.

The philosophy of the School of Nursing encompasses and extends the philosophy of the University of Maine, of which it is a part. The curriculum is based on the philosophy that professional nursing education should prepare an individual who will make a positive contribution to the welfare of the community through the effective practice of nursing in a changing world and who will achieve both personal and professional satisfaction.

The professional education is built on the knowledge, discipline and cultural understanding acquired through study of the arts and sciences. The curriculum provides an opportunity for the student to develop ability in critical thinking and communications, an understanding of human needs, a knowledge of the characteristics of health and its deviations, and the skill necessary to use all of these in the nursing care of people of all ages.

The total program is planned to prepare the graduate who will:

1. Accept as a responsibility of nursing the promotion of physical and mental health and the prevention of illness as well as the care and rehabilitation of the sick.
2. Use knowledge of the characteristics of health and its deviations and an understanding of human needs to make critical judgments in assessing, planning, directing, implementing and evaluating the nursing care of people of all ages.
3. Practice professional nursing in a beginning position in the home, hospital, or other community agencies working with individuals, families and other groups.
4. Recognize the impact of social change and use the knowledge, discipline and cultural understanding acquired from the study of the arts, the general sciences and nursing to adapt personally and modify professional nursing practice.
5. Be able to communicate effectively through the various media.
6. Assume the responsibility for continued personal and professional growth.
7. Be a responsible member of the community.

The first two years of the program are offered on both Orono and Portland campuses, and consist largely of the general education courses which provides a foundation for the clinical courses of the junior and senior years. These are taught in Portland and other clinical areas.

The course requires eight full semesters, plus a summer session between the sophomore and junior years. Upon satisfactory completion of the course, students receive the bachelor of science degree and are eligible to take State Board Examinations for licensure as registered nurses.

The student in the School of Nursing, as a regularly enrolled undergraduate in the University, is entitled to use all facilities of the University for study, scholarship aid, and extracurricular activites.

The clinical experience for the major portion of the nursing courses is available at the Maine Medical Center in Portland, Children's Psychiatric Hospital at the Pineland State Hospital and Training Center, Pownal, The Division of Public Health Nursing of the State of Maine, Department of Health and Welfare, and the Portland City Health Department.

Fees and expenses will be essentially the same as those of other students for all four years, with the addition of the summer session, and nursing uniforms (approximately $90) which are purchased during the spring of the sophomore year.

Dormitory facilities are provided by the University on the Orono campus and for the last two years in Portland. Special living arrangements are made during the course in community health nursing if the assignment requires it.

A student must provide herself with a car for psychiatric and community health nursing experiences and must pay the cost of this. She must have a driver's license current in some state in order to register for the senior year.

In order to enter the junior year of the program the student must have a minimum accumulative average of 1.8. A minimum grade of "C" must be achieved in theory and practice in all clinical nursing courses.

The School of Nursing reserves the right to request the withdrawal of any student who fails to make satisfactory adjustment to the field of nursing.

Nu 1. Introduction to Nursing—A survey of the expanding responsibilities and functions of the professional nurse in contributing to the health of the individual, the family, and the community, with emphasis on the changing health problems. *Cr* 2. HAMILTON

Nu 2. Introduction to Nursing—The historical interrelationship of social, cultural, and health factors of civilization with the development of nursing and education. *Cr* 2. HAMILTON

Nu 3. Fundamentals of Nursing—An introduction to the nursing care of patients. Guided learning in selected nursing activities through lectures, seminars, audio-visual aids, laboratory and clinical experience. *Cr* 3. STONE AND STAFF

Nu 4. Community Health—The health and welfare needs of individuals and families and community attempts to meet them. Includes some of the essentials of promoting health and preventing disease and stresses the role of the health worker in community health organization. Field trips to local agencies. *Cr* 3. CAMPBELL

Nu 5. Nursing of Adults—Concerned with the major health problems of adults and the nursing functions needed to meet these. Guided clinical experiences. *Cr* 12. TALBOT AND STAFF

Nu 6. Nursing of Mothers and Children—A total family centered approach to nursing needs of mothers and children. Guided experiences in the field of maternal and infant care and care of the child. Study emphasizes the normal mother and infant and the effect of the ill child on the family. Community resources needed to meet the needs of families during the child rearing and child bearing periods are explored. *Cr* 12. TRYON AND STAFF

Nu 9. Community Health Nursing—Concepts and selected experiences

essential to the understanding of the principles, scope, trend, organization and administration of nursing in community health agencies. *Cr* 6. ROSCOE, FISH

Nu 10. Psychiatric Nursing—Symptomatology and treatment of mental illness. Principles of dynamic psychiatry. Guided experience in the nursing care of selected patients. Community aspects are included. *Cr* 6.

COTTON, MADDOX

Nu 13. Comprehensive Nursing—Provides opportunities for integrating knowledge and skills in ministering to individual patients with complex health problems and in assuming the responsibility for the nursing care of a group of patients. Provides also for the greater development of skills in organization and management of nursing care and in teaching. *Cr* 12. STONE, ELLIS

FRESHMAN YEAR

			Hours
Ch	11/12	General Chemistry	8
Eh	1	Freshman Composition	3
Eh	9 or 10	Modern Literature	3
Nu	1.2	Intro. to Nursing	4
Pe	1.2	Physical Education	0
*Py	1/2	General Psychology or	
*Sy	3/4	Intro. to Sociology or	
		**Elective	6
Zo	3	Animal Biology	4
Zo	8	Anatomy and Physiology	5
			33

SOPHOMORE YEAR

			Hours
By	127	General Bacteriology	
	128	and Laboratory	4
Fn	152	Human Nutrition	3
Nu	4	Community Health	3
Nu	15	Intro. to Pharmacology	1
*Py	1/2	General Psychology or	
*Sy	3/4	Intro. to Sociology	6
Sh	1	Public Speaking	3
		**Electives	12
			32

SUMMER SESSION

Nu	3	Fundamentals of Nursing	3

JUNIOR YEAR

Nu	5	Nursing of Adults	12
Nu	6	Nursing of Mothers & Children	12
Py	123	Psychology of Childhood	3
		Elective	3
			30

SENIOR YEAR

Nu	9	Community Health Nursing	6
Nu	10	Psychiatric Nursing	6
Nu	13	Comprehensive Nursing	12
Nu	18	Seminar in Nursing	2
		Elective	3
			29

* Py 1/2 and Sy 3/4 are required and must be taken either freshman or sophomore year.
** Chosen from the humanities and social sciences. Humanities requirement must be met.

SCIENCE AND MATHEMATICS

HAIG H. NAJARIAN, Chairman

BIOLOGICAL SCIENCES

PROFESSOR NAJARIAN (DISCIPLINE REPRESENTATIVE); ASSOCIATE PROFESSOR KERN; ASSISTANT PROFESSORS GREENWOOD, HOLMES, MAZER, MAZURKIEWICZ

A four-year program is offered in biological sciences, and although the major is designed for students desiring graduate work in biology, or students interested in going into medicine, dentistry or veterinary science, the program can be modified to satisfy requirements in other aspects of life science and para-medical fields.

The program includes 30 hours in biological sciences, among which the following are requirements:

Zo 3 Animal Biology

Bt 1 General Botany

Zo 136 Development Biology

Zo 162 Principles of Genetics

Zo 177 Animal Physiology

In addition to the general non-science requirements of the College of Arts and Sciences (Orono), the following courses are also required for a bachelor's degree at biological science at Portland:

Ms 12 Analytic Geometry and Calculus

Ch 1/2 General Chemistry

Ch 151/152-161/162, Organic Chemistry (with lab)

or

Bc 1 Organic Chemistry and Bc 2, Biochemistry

Ps 1/2 or Ps 1a/2a, General Physics

By 127. General Bacteriology—A study of microorganisms with emphasis on their phylogenetic relationships to other forms of life. The physiological reactions associated with the metabolic activities of the single cells are discussed. Certain beneficial and harmful activities of microorganisms and how they affect man are presented. Prerequisite: Ch 2. *Rec* 2, *Cr* 3. HOLMES

By 128. Laboratory for General Bacteriology—A laboratory study of microorganisms to teach the basic procedures for staining, isolation and study of microscopic forms. Specific experiments presented pertaining to the ability of microorganisms to grow in various substrates. The end-products of metabolism. The applied phases of water, food, milk and sewage microbiology. Prerequisite: By 127. *Lab* 4, *Cr* 2. HOLMES

Bt 1. General Botany—An introduction to the structure, function, and reproduction of seed plants. Open to students of all colleges. *Rec* 3, *Lab* 2, *Cr* 4. KERN

En 26. Introductory Entomology—Fundamental principles of insect life and the relations of insects to plants, animals, and man. A study of structure, metamorphosis, ecology, and classification. Prerequisite: Bt 1 or Zo 3. *Rec* 2, *Lab* 4, *Cr* 4. MAZURKIEWICZ

Zo 3. Animal Biology—The principles of animal life, including properties of cells, heredity, ecology, evolution and a review of major phylum types. *Lec* 2, *Lab* 4, *Cr* 4. KERN AND STAFF

Zo 8. Anatomy and Physiology—The general principles of animal life, with emphasis on the structure and functions of the human body. Prerequisite: Zo 3. *Lec* 2, *Rec* 1, *Lab* 2, *Cr* 4. KERN

Zo 10. Anatomy and Physiology—Similar to Zo 8, with additional time for laboratory. For students in the School of Nursing. Prerequisite: Zo 3. *Lec* 2, *Rec* 1, *Lab* 4, *Cr* 5. KERN

Zo 12. Organic Evolution—The biological development of higher forms of life from the simpler. The evidence which support this fact and the processes which bring it about. Open to all non-majors above freshman standing. *Lec* 2, *Cr* 2. GREENWOOD

Zo 136. Developmental Biology—The transformation of the fertilized egg into a new adult individual: the concepts of growth and development of organisms. Prerequisite: Zo 3. *Lec* 2, *Lab* 4, *Cr* 4. GREENWOOD

Zo 151. Histology—Microscopic anatomy of animal tissues and methods of preparing microscopic slides. Prerequisite: Zo 3. *Lec* 2, *Lab* 4, *Cr* 4. HOLMES

Zo 153. Invertebrate Zoology—The morphology, physiology, life histories, phylogenetic relationship, and economic importance of invertebrates. Prerequisite: Zo 3. *Lec* 2, *Lab* 4, *Cr* 4. NAJARIAN

Zo 156. Animal Ecology — The interrelationships between animals and their physical and biotic environment. Topics include essentials of existence, ecosystem concepts, energy relationships, populations, communities, distribution, adaptations and applications. Prerequisite: Zo 3. *Lec* 2, *Lab* 4, *Cr* 4. MAZURKIEWICZ

Zo 158. Animal Parasitology—The life histories, economic importance, methods of control, host necropsy and the preparation of parasites. Prerequisite: Zo 3. *Lec* 2, *Lab* 4, *Cr* 4. NAJARIAN

Zo 162. Principles of Genetics—The nature of hereditary factors and the mechanisms by which they are transmitted and expressed. Prerequisite: Zo 3 and junior standing. *Lec* 3, *Cr* 3. GREENWOOD

Zo 164. Genetics Laboratory—Practical experience in the rearing of some genetically important laboratory species, and analysis of the resulting data. Prerequisite: Zo 162 or concurrently. *Lab* 4, *Cr* 2. GREENWOOD

Zo 177. Animal Physiology—Physiological processes in vertebrates with emphasis on the integration of organ systems. Prerequisite: Zo 3 and at least one year of chemistry. *Lec* 2, *Lab* 4, *Cr* 4. MAZER

Zo 178. General Physiology—The vital phenomena common to all organisms. Membrane properties are treated at length. Prerequisite: Zo 177, Organic Chemistry and one year of physics. *Lec* 2, *Lab* 4, *Cr* 4. MAZER

Zo 179. Experimental Endocrinology—A comprehensive survey of the vertebrate endocrine glands and their functional relationships. The experimental and comparative approach is emphasized. Prerequisite: Zo 3, Zo 177, and Organic Chemistry. *Lec* 2, *Lab* 4, *Cr* 4. MAZER

Zo 180. Cell Mechanisms—A physio-chemical analysis of cell metabolism. Emphasis on mechanisms controlling growth and division. Prerequisite: Zo 3, Organic Chemistry or Biochemistry. *Lec* 2, *Cr* 2. HOLMES

Zo 187. 188. Problems in Zoology—Open to juniors and seniors who have special interest and qualifications in some branch of zoology. Admission by permission of staff. *Cr Ar.*

Zo 195. 196. Zoology Seminar — Oral reports and discussion by class members, covering biological topics of current interest. *Rec* 2, *Cr* 1.

CHEMISTRY

ASSOCIATE PROFESSORS SMITH (DISCIPLINE REPRESENTATIVE), SOTTERY

Except for Ch 140 (Quantitative Analysis), students may complete the first two years of a chemistry major at the Portland campus. The freshman year offerings are identical to the common curriculum of technology students at Orono. The sophomore year curriculum appears in Orono section of the catalog under Chemistry Curriculum. A reading knowledge of German is required and may be met by examination.

Bc 1. Organic Chemistry—A brief survey of those functional groups of organic compounds which are of interest for substances found in living systems. Minimal development of modern theories and an elemental introduction to applications of chemical spectroscopy. Laboratory work includes training in qualitative organic chemistry, chromatographic methods (gas-liquid, thin-layer, and column), simple kinetics studies of chemical reactions, and use of spectroscopic methods. Recommended only as a prerequisite for Bc 2. Prerequisite: Ch 14. *Rec* 3, *Lab* 2, *Cr* 4. SMITH

Bc 2. Biochemistry—An elemental and brief survey of the chemistry and biochemistry of carbohydrates, lipids, proteins, nucleic acids, and accessory compounds of metabolism. Some of the major metabolic pathways considered in a summarized manner, including glycolysis, and Krebs Cycle, urea cycle, fatty acid metabolisms, and protein synthesis. The application of the concepts of pH and buffers is studied. Laboratory work comprises qualitative and quantitative experiments on the various types of biochemical compounds, and elementary kinetic studies of enzyme action. Not recommended for those intending further studies in biochemistry. Prerequisite: Bc 1 or Ch 152. *Rec* 3, *Lab* 2, *Cr* 4. SMITH

Ch 11/12. General Chemistry—Selected topics in chemistry. Present concepts explored in terms of historical development and philosophical significance. Qualitative understanding is stressed rather than quantitative application. Recommended for students who wish to enhance their understanding and appreciation of the role of physical science in the modern world. (Previous study of chemistry is not assumed.) *Rec* 3, *Lab* 3, *Cr* 4. SOTTERY

Ch 13/14. Chemical Principles—An intensive examination of modern chemistry, comprising structural theory (atomic and molecular levels), stoichiometry, kinetics and equilibrium, colligative properties, elementary thermodynamics, ionic equilibria, and electrochemistry. A strong mathematical background is essential for mastery of this course. Laboratory work includes qualitative and quantitative experiments intended to illustrate lecture presentation. Recommended for students who plan further study in science or engineering. *Rec* 3, *Lab* 3, *Cr* 4.

SMITH

Ch 151/152. Organic Chemistry Lecture—An introduction to the chemistry of carbon compounds. Modern theories of reaction mechanisms are stressed. Recommended for majors in chemistry, and biological sciences. Prerequisite: Ch 14. *Rec* 3, *Cr* 3. SOTTERY

Ch 161/162. Organic Chemistry Laboratory—An introduction to laboratory techniques used for the synthesis and study of organic compounds. Prerequisite: Credit or concurrent registration in Ch 151/152. *Lab* 4, *Cr* 2. SOTTERY

ENGINEERING

ASSOCIATE PROFESSORS HOPKINSON, KIRWIN (DISCIPLINE REPRESENTATIVE)
ASSISTANT PROFESSOR UN

The Portland campus offers the first common year of engineering (the curriculum being identical to that of a prospective chemistry major or technology student), and the second year for electrical engineering students, as well as a master's degree in engineering (administered through the C.E.D. Division).

Ge 1/2. Introduction to Engineering Design — Creative exercises in multi-view drawing using freehand and instrumental techniques. Course 2 introduces pictorial drawing, descriptive geometry, and concludes with the preparation of working drawings for an elementary design problem requiring creative thinking. *Rec and Lab* 4, *Cr* 2. HOPKINSON

Ge 5/6. Technology Orientation—A series of meetings involving lectures and discussions, with frequent use of audio-visual material to acquaint engineering freshmen with the nature of engineering and science. *Rec* 1, *Cr* 0. HOPKINSON

Ge 7. Computer Programming for Engineers — Digital programming using Fortran IV language and appropriate numerical methods for the solution of applied problems involving roots of equations, numerical integration, and matrix algebra. Last five weeks of the semester devoted to analog computer exercises, including time and magnitude scaling. Prerequisite: Ms 28 (may be taken concurrently). *Rec* 1, *Lab* 2, *Cr* 2. KIRWIN

Me 52. Applied Mechanics, Dynamics—A study of motion of particles and rigid bodies; force, mass and acceleration; work and energy and simple harmonic motion. Prerequisite: Me 50, Ms 28. *Rec* 3, *Cr* 3. HOPKINSON

Me 55. Statics and Strength of Materials—The basic principles of statics and their applications in strength of materials. Equilibrium of various systems. Stresses and deformations of axially loaded members, connections, circular shafts, beams and columns. Prerequisite: Ms 28. *Rec* 3, *Cr* 3. HOPKINSON

Ee 1. Circuit Analysis I—Basic laws and theorems of electric circuits; solution of circuits represented by first and second order differential equations. Prerequisite: Ps 2 and Ms 27. *Rec* 4, *Compt. or Lab* 3, *Cr* 5. KIRWIN

Ee 2. Circuit Analysis II—Phasor solution of a-c circuits coupled circuits; balanced three-phase systems; introduction to complex frequency. Prerequisite: Ee 1. *Rec* 3, *Cr* 3. KIRWIN

Ee 12. Basic Electrical Laboratory — Use of techniques developed in Ee 1, 2 for the analysis of circuits containing linear, nonlinear, passive and active elements; includes analysis of simple electronic circuits and the use of the oscilloscope. Prerequisite: Ee 2 required concurrently. *Rec* 1, *Lab* 3, *Cr* 2. KIRWIN

GEOLOGY

PROFESSOR TREFETHEN (DISCIPLINE REPRESENTATIVE)

Only two courses are offered, both open to all students and without prerequisite.

Gy 1a. Physical Geology (Descriptive)—A study of earth materials and processes, volcanism, mountain-building, the work of seas, streams, ice and winds. Two afternoon field trips. *Lec* 3, *Cr* 3. TREFETHEN

Gy 2a. Historical Geology—The geologic history of the earth and the development of life upon it. One one-day field trip. *Lec* 3, *Field trip*, *Cr* 3. TREFETHEN

MATHEMATICS AND ASTRONOMY

ASSOCIATE PROFESSORS CANTY, GUAY, ROGERS (DISCIPLINE REPRESENTATIVE); ASSISTANT PROFESSORS BROWN, MAINVILLE; INSTRUCTORS CHABOT, FOSTER.

A four-year program leading to the B.S. degree in mathematics is offered, as well as offerings to meet the needs of several types of undergraduate and graduate students.

There is no major program in astronomy, the only offering being As 9, Descriptive Astronomy, given in C.E.D., *Credit* 3.

During the first two years a mathematics major takes the following courses: Ms 12, 21, 22, 27, 28, 29. During the third and fourth years a mathematics major will:

1. Successfully complete three courses from the following four areas: Ms 130, Ms 171, Ms 173, Ms 175 or Ms 176. Only one of Ms 175, Ms 176 (not both) will satisfy this requirement.
2. Successfully complete other approved courses to accumulate a minimum four-year total of 39 credit hours in mathematics.

Mathematics courses Ms 1, Ms 2, Ms 3, Ms 5, Ms 6, Ms 7, Ms 8, Ms 9, Ms 10, Ms 13, Ms 14, Ms 15, Ms 16, Ms 17, and Ms 19 are not creditable toward the 39 credit hour minimum.

Students intending to pursue graduate work in mathematics are strongly urged to take Advanced Calculus and Abstract Algebra and to satisfy their language requirement by taking French, German or Russian.

Ms 2. Elementary Functions and Analytic Geometry—A study of the polynomial, logarithmic, exponential and trigonometric functions; equations, inequalities, cartesian and polar coordinate systems and the related analytic geometry. The unifying role of the function concept and the interplay of algebra and geometry is emphasized. Prerequisite: two years of high school algebra. *Cr* 3.

Ms 5/6. Elements of College Mathematics—Modern viewpoints on certain basic mathematical material. Intended primarily for non-mathematics majors. *Cr* 3.

Ms 12. Analytic Geometry and Calculus—Equations and graphs, differentiation and integration of polynomials, applications. Prerequisite: Trigonometry and the equivalent of Ms 3. *Cr* 4.

Ms 13. Elementary Analysis — A unified treatment of the elementary functions of analysis; their analytical properties including derivatives, integrals and series. Prerequisite: Three years high school college prep math. *Cr* 3.

Ms 14. Elementary Probability — Elements of probability using discrete

and continuous sample spaces. Common probability laws; expected values; introduction to estimation and hypothesis testing. Prerequisite: Ms 12 or 13. *Cr* 3.

Ms 15. Analysis and Statistics—Some calculus of functions of more than one variable, partial differentiation; optimization; multiple integration; sampling distributions: estimation; hypothesis testing; introduction to regression analysis and analysis of variance. Prerequisite: Ms 14. *Cr* 3.

Ms 16. Linear Systems—An introduction to vectors, matrices, linear systems of algebraic and differential equations; interpolation procedures and difference equations; linear programming, and Markov processes. Prerequisite: Ms 15. *Cr* 3.

Ms 19. Principles of Statistical Inference—An introductory course including such topics as distributions sampling variability, estimation, hypothesis testing and regression. *Cr* 3.

Ms 21. Elements of Set Theory—An introduction to general set theory. *Cr* 2.

Ms 22. Elements of Real Number Theory—The real number system developed from a foundation in intuitive set theory. *Cr* 2.

Ms 27. Analytic Geometry and Calculus—Conic sections; differentiation and integration of algebraic, trigonometric, logarithmic and exponential functions; applications. Prerequisite: Ms 12 or consent of the department. *Cr* 4.

Ms 28. Analytic Geometry and Calculus—Polar coordinates, geometry of three dimensions, infinite series, partial derivatives; multiple integrals; applications. Prerequisite: *Ms* 27. *Cr* 4.

Ms 29. Differential Equations—An introduction to ordinary differential equations; application. Prerequisite: Ms 28. *Cr* 4.

[***Ms 103. Linear Programming I***]—Formulation of the general linear programming problem, homogeneous and non-homogeneous linear equalities, and simplex method for non-degenerate cases, simplex computational procedure and check concluding slack, surplus and artificial variables, revised simplex procedures, degeneracy and cycling. Prerequisites: Ms 124, Ms 172, or permission. *Cr* 3.

Ms 124. Matrix Theory—An introduction to the elementary properties and applications of matrices. Prerequisite: Ms 28 or permission. *Cr* 3.

Ms 130. Mathematical Statistics I—Probability and principles of inference. Particular emphasis given to the normal distribution and related sampling distributions. Prerequisite: Ms 28. *Cr* 3.

Ms 131. Mathematical Statistics II—A continuation of Ms 130 including topics such as decision functions, non-parametric methods and an introduction to analysis of variance. Prerequisite: Ms 130 or permission. *Cr* 3.

Ms 149. Mathematics for Teachers—A modern approach to selected topics in mathematics with methods of presentation to secondary school students. Prerequisite: Ms 28 or consent of the department. (Evenings only) *Cr* 3.

[***Ms 152. Introduction to Complex Variables***]—Analytic functions, integration, series, and mapping. Prerequisite: Ms 28. *Cr* 3.

Ms 161. History of Mathematics—The development of elementary mathematics from ancient to modern times. Prerequisite: Ms 12. *Cr* 3.

Ms 165. Theory of Numbers—Elementary properties of the integers. Prerequisite: Ms 28. *Cr* 3.

[***Ms 171. Introduction to Abstract Algebra***]—Algebraic structures such as groups, rings, integral domains, and fields. Prerequisites: Ms 21 and Ms 22. *Cr* 3. (Evenings only)

[***Ms 172. Linear Algebra***]—An introduction to the theory of vector spaces and linear transformations. Prerequisite: Ms 171. (Offered in C.E.D. only) *Cr* 3.

[***Ms 173/174. Advanced Calculus***]—Functions of real variables, limits, infinite series, partial differentiation, and other topics. Prerequisite: Ms 28. *Cr* 3. (Evenings only)

[***Ms 175/176. Higher Geometry***]—An introduction to various geometries, such as projective and non-Euclidean. Prerequisite: Ms 28. *Cr* 3.

Ms 187. Numerical Analysis — Computational methods for electronic computers with exercises on the IBM 360 for interpolation, simultaneous linear algebraic equations, non-linear and polynomial equation, numerical integration, and ordinary and partial differential equations. Prerequisite: Ms 28 and Ms 169. *Cr* 3. (Evenings only)

Ms 197/198. Foundations of Mathematics—Fundamental concepts and methods of mathematics; viewpoints on the foundation of mathematics. *Cr* 3.

PHYSICS

Assistant Professor Armentrout (on leave 1969-'70)
Associate Professor Walkling (Discipline Representative)

A physics major is not offered at the Portland campus. A student beginning Ps 1/2 in the fall semester of 1969 may expect to complete the first two years of a physics major, after which he must transfer to the Orono campus to complete his program.

Students intending to major in physics should normally register to take Ps 1/2, Ms 12 and Ms 27 as freshmen. Since the degree program is currently completed in Orono, the degree requirements outlined in the Orono section of the catalog will apply to all physics majors.

Ps 1/2. General Physics—The fundamentals of mechanics, matter, sound, heat, electricity, magnetism, light, and modern physics. The course meets the needs of engineering and science students. Calculus will be used. *Lec with Dem* 2, *Rec* 1, *Lab* 3, *Cr* 4.

Ps 1a/2a. General Physics—The fundamentals of mechanics, sound, heat, electricity, magnetism, light, and modern physics. Similar to Ps 1/2 but modified laboratory program with less emphasis on computations and more emphasis on discussion and graphical methods. Calculus is not used. Meets the needs of predental and premedical students. *Lec with Dem* 2, *Rec* 2, *Lab* 2, *Cr* 4.

Ps 3. Descriptive Physics—For the non-science student. A treatment in non-mathematical language of the more important topics in physics. Designed to develop an appreciation for the concepts, vocabulary, and methods of the science rather than a false sense of mastery. *Lec with Dem* 3, *Cr* 3.

[***Ps 17/18. Intermediate Physics***]—A more mathematical treatment with the calculus of many of the topics in courses Ps 1/2 or Ps 1a/2a, either of which is a prerequisite: (With special permission, students may register for this course under the number Ps 17a.18a without laboratory *for three credit hours.*) *Lec* 2, *Comp* 2, *Lab* 2, *Cr* 4.

Ps 36. Introductory Modern Physics for Engineers—Selected topics in molecular, atomic, electronic, and nuclear physics, intended to meet the needs of the present-day engineering student. College physics, calculus, and some chemistry are prerequisite. *Lec* 2, *Rec* 1, *Cr* 3.

UNIVERSITY OF MAINE

PSYCHOLOGY

PROFESSOR SALDANA (DISCIPLINE REPRESENTATIVE); ASSOCIATE PROFESSORS BISHOP, SANBORN

The discipline of psychology offers a four-year program for students majoring in psychology. It also includes courses for students majoring in allied fields as well as for students wishing an orientation to the field of psychology as part of their general education. Courses are designed to create an awareness of the fundamental principles of psychology, its research finds, and the means by which psychological knowledge is acquired. The emphasis is upon the scientific inquiry into basic phenomena and principles of behavior, not upon the development of professional skills.

The minimum requirement for a major in the discipline is 36 hours, which must include the following:

Py 1/2	General Psychology
Py 74	Seminar in Issues in Contemporary Psychology
Py 141	Statistics in Psychology
Py 147/148	Experimental Psychology
Py 171	History and Systems of Psychology

In addition to each major is required to take at least one course from each of the following groups:

Group 1:	Py 151	Psychology of Motivation
	Py 155	Psychology of Learning
	Py 156	Theories of Learning
	Py 161	Sensation and Perception
Group 2:	Py 130	Social Psychology
	Py 132	Mental Hygiene
	Py 133	Abnormal Psychology
	Py 138	Theories of Personality
Group 3:	Py 123	Psychology of Childhood
	Py 124	Psychology of Adolescence
	Py 126	Psychology of the Retarded Child
	Py 127	Psychology of the Superior Child
	Py 128	Psychology of the Exceptional Child
Group 4:	Py 111	Business and Industrial Psychology
	Py 114	Aptitude Testing
	Py 117	Educational Psychology
	Py 143	Psychological Test Theory and Individual Differences

In addition to the general requirements above, Ms 19, Principles of Statistical Inference, is also required for the degree in psychology.

Py 1/2. General Psychology—A general introduction to the science of behavior. Topics discussed include physiological bases of behavior, sensation and perception, motivation, learning, thinking, intelligence, personality, social behavior and behavior disorders. *Cr* 3. SALDANHA

Py 45. Principles of Experimental Psychology — General principles, methods and techniques of experimental psychology. Applications of general methodology and specific techniques to major problem areas in behavioral research. Laboratory exercises provide experience in collecting and reporting data. Prerequisite or to be taken concurrently: Py 141. *Rec* 2, *Lab* 2, *Cr* 3.

Py 74. Seminar in Issues in Contemporary Psychology—A review of some of the current theoretical issues and research findings in the general areas of psychology. Seniors only. *Cr* 3.

Py 111. Industrial Psychology—Applications of psychological principles, facts and research methods to problems of selection, placement, efficiency, equipment design, training, motivation and morale in industry. *Cr* 3. SALDANHA

Py 123. Psychology of Childhood—A systematic study of the child's behavior and psychological development. Emphasis upon principles underlying development, methods of child study, and practical implications. *Cr* 3.

Py 124. Psychology of Adolescence—A systematic study of the behavioral and psychological development of the adolescent. The adolescent personality and problems of adjustment in relation to the family, the school and the community. *Cr* 3.

Py 128. Psychology of the Exceptional Child—A consideration of the development and behavior of the exceptional child. Special emphasis on the practical problems related to the management of children with intellectual, emotional, orthopedic, sensory, and academic handicaps. Prerequisite: Py 123. *Cr* 3. BISHOP

Py 130. Social Psychology—A study of social factors in psychology and psychological factors in society with particular reference to the psychology of social attitudes, prejudice, propaganda, group dynamics, and selected social problems. *Cr* 3. BISHOP

Py 133. Abnormal Psychology—The origin, development, and manifestations of the psychoneuroses and major psychoses with a view to better understanding of adjustment. Emphasis on the biological, social and psychological determinants of maladjusted behavior. Prerequisite: Py 1/2 with grade of C or better. *Cr* 3. BISHOP

Py 138. Theories of Personality—A survey of the chief contemporary approaches to the study of personality. Critical issues in personality. Consideration of assessment techniques and research methods. Prerequisite: Py 1/2 with grade of C or better. *Cr* 3. BISHOP

Py 141. Statistics in Psychology—A general introduction to the techniques of descriptive and sampling statistics. Emphasis will be placed on measures of central tendency, variability, correlation, hypothesis testing, tests of significance, and simple analysis of variance. Prerequisite: Ms 19. *Cr* 3.

Py 143. Psychological Testing—The psychological testing of intelligence, aptitudes, interests and personality. Principles of test construction and administration, the theory of test scores, and the practical utilization of test data will be considered. Prerequisite: Py 141 or equivalent. *Cr* 3. BISHOP

Py 147. 148. Experimental Psychology—*First semester:* Techniques and objective approach to the study of human perception, learning, psychophysics, etc. Training in writing psychological research reports. *Second semester:* Basic principles in programming and use of operant conditioning procedures with animal subjects. Planning and conducting an original investigation by the student. *Rec* 2, *Lab* 4, *Cr* 4. Prerequisite or concurrently: Py 141.

Py 151. Psychology of Motivation—A survey of theory, research methodology and experimentally obtained facts related to the activation and direction of behavior. Laboratory exercises provide experience in collecting and reporting data. The course requires planning and conducting an original investigation by the student. Prerequisite: Py 155. *Rec* 2, *Lab* 2, *Cr* 3.

Py 155. Psychology of Learning—A survey of the basic principles that underlie the acquisition and retention of new behavior. Emphasis in laboratory work is on the execution and analysis of experiments on animal and human learning. Prerequisite: Py 45. *Rec* 2, *Lab* 2, *Cr* 3.

Py 156. Theories of Learning—An examination of the most important current psychological theories concerning the nature of the learning process, including the behavioristic (Guthrie, Skinner, Hull, and Estes) and the Gestalt (Lewin and Tolman) position. An evaluation of the theories will be made. Prerequisite: Py 155. *Cr* 3.

Py 161. Sensation and Perception—Laboratory studies of selected sensory and perceptual processes. Emphasis on experimental methods, including information processing approaches, research findings and theoretical interpretations. Prerequisite: Py 45. *Cr* 3.

Py 165. Physiological Psychology—Neuroanatomy, neurophysiology, and endocrinology considered in their relation to various behavioral processes. Special emphasis on examination of recent research studies. Prerequisite: Zo 3/4, Py 45. *Rec* 2, *Lab* 2, *Cr* 3.

Py 171. History and Systems of Psychology—An historical account of the development of psychology: the development of psychological concepts and points of view prior to Wundt; a consideration of the major modern systems and schools of psychology. *Cr* 3. SALDANHA

SOCIAL SCIENCES

PHILLIP A. COLE, CHAIRMAN

EDUCATION

ASSOCIATE PROFESSORS RHOADES (DISCIPLINE REPRESENTATIVE), SOULE; ASSISTANT PROFESSORS CHRONISTER, COLUCCI; INSTRUCTORS MOORE, SMITH

Education, a discipline within the Social Science Division, concerns itself with direct preparation of school teachers and with providing professional courses for students in any college of the University who wish to meet teacher certification requirements. The program includes 50 hours or more of general education (preferably completed by the end of the sophomore year), an academic area of concentration, and professional courses appropriate to the level. This reflects the goal of producing teachers with a rather broad background, knowledge in some depth of a limited area, and techniques or skills to put this material across to the pupil or student.

At present, UMP offers a teacher-training program that is approved for secondary level only. Many have been able to meet requirements for elementary level, but methods courses unique to elementary preparation are offered only through the Continuing Education Division (late afternoon, evenings, and Saturdays) with no guarantee that required courses will be provided to meet a particular student's need at a given time.

Areas of academic concentration (for secondary teachers) that can be completed at UMP include English, social studies, mathematics, French, and the general science teacher program.

Each student, whether enrolled in the College of Education or in another college of the University, who plans a teaching career must be formally accepted into the Teacher Education Program and needs to complete an activity referred to as the Exploratory Field Experience. This program requires that all students, prior to the completion of their sophomore year, spend no less than one week of observation in a public school classroom. This requirement may be met at any time the University is not in session, but when the public school is in session. The student will serve as an assistant staff member (teacher aid) in addition to observing in the classroom. He will be under the jurisdiction of the school, like any regular staff member, although no compensation is given. This is not a student teaching experience but one which serves to familiarize the student with some of the responsibilities of a full-fledged teacher.

The culminating phase of teacher preparation is student teaching, which involves full-time classroom work in a public school over an eight-week period, during which the student is supervised by the regular classroom teacher and by a supervisor from the College of Education.

Students in education must obtain a 2.0 (C) average or better in the academic concentration area, a 2.0 average or better in the professional courses, and a 2.0 average or better in overall grade point average before the degree will be awarded.

Master of Education: In the fall of 1967, UMP initiated a limited M.Ed. Program, with academic areas of concentration in English, history, and mathematics. Courses have been arranged so that all requirements may be met on the Portland campus. These graduate programs are intended to expand the preparation of the teacher. For those who wish to prepare themselves for such specialized areas of school service as administration, supervision or guidance, several appropriate courses are available at Portland, but such programs must be completed at the Orono campus. Eligibility for admission to programs leading to the master of education degree is based upon the completion of an approved teacher education program appropriate to the graduate program requested

Specific information regarding aspects of the education program may be obtained from the Education Secretary (204 Payson Smith) or from any member of the education faculty.

Ed B 2. The American School—Examines the nature, role, purposes, and curriculum of elementary and secondary schools, with special attention to the place and function of the teacher within this social institution. This is one of the courses prerequisite to student teaching in all regular undergraduate programs. Not open to freshmen. *Cr* 3.

Ed B 3. Growth-Learning Process—The pupil and his learning processes, including learning theories, pupil growth patterns, and selected techniques for the study of pupil development. This is one of the courses prerequisite to student teaching in all regular undergraduate programs. Not open to freshmen or sophomores. *Cr* 3.

Ed B 4. The Teaching Process—The procedures of instructional planning, including such items as improved use of small groups, classroom space, and appropriate teaching materials; measurements, evaluation, and reporting of pupil learning. This is one of the courses prerequisite to student teaching in all regular undergraduate programs. Not open to freshmen or sophomores. *Cr* 3.

Ed M 190. Full-Day Student Teaching (Elementary)—A full-day, off-campus internship program in a selected school for one half of the semester; a full-day, on-campus program of college courses is provided for the other half of the semester. Special conferences and group discussions as required. Prerequisites: Ed B 2, Ed B 3, Ed B 4 or their equivalents, two methods courses, one of which shall be in reading (preferably Ed M 18), and senior standing. *Cr* 8.

Ed M 191. Full-Day Student Teaching (Secondary)—A full-day, off-campus internship program in a selected school for one half of the semester; a full-day, on-campus program of college courses is provided for the other half of the semester. Special conferences and group discussions as required. Prerequisites: Ed B 2, Ed B 3, Ed B 4, or their equivalents, methods course, and senior standing. *Cr* 6.

HISTORY

Associate Professors Cole (Discipline Representative), Hunt; Assistant Professors Albee, Cannon, Connick, Witmore; Instructor Dietrich

The courses offered by the history discipline are intended to provide a broad acquaintance with the past experience of human society. The history curriculum offers the student an opportunity to participate in and investigate the procedures and methods of historical study through lectures, discussion, research, and the writing of history; or, combined with the necessary academic credits in education, the program will provide certification for teaching at the secondary level.

History majors find employment in all fields, including business. Specialization in history is especially valuable as pre-professional training for law, government, diplomacy, theology, journalism, and for library, archival, and museum administration. The history major must complete: (1) either Hy 3.4 or Hy 3a/4a; (2) Hy 5.6; (3) either Hy 115.116 or Hy 147.148; (4) Hy 190 (preferably in the sophomore or junior year), and at least 18 hours of advanced history courses approved by his adviser.

It is recommended that students balance their course selections among categories A, B, and C.

CATEGORIES

A United States	B Europe	C Asia and Latin America
3.4	1.2	115.116
3a/4a	5.6	135.136
10	101.102	137
159.160	103.104	138
161	107	139.140
162	108	147.148
165	109	149
166	110	150
167	111.112	151
168	121.122	152

169	123.124
170	129.130
171.172	131.132
173.174	133.134
175.176	141.142
178	155.156
182	230
183	
186	
188	
189	
270	

[***Hy 1. 2. Classical and Medieval Civilization***]—The social and cultural development of the ancient Greeks and Romans is treated in first semester. The second semester deals with the social and cultural development of Western Europe in the Middle Ages. Particular attention is given to the great achievements in literature, philosophy, religion, and art. This course satisfies the humanities requirement of the College of Arts and Sciences. *Cr* 3.

Hy 3. 4. United States History—From 1789 to recent years. The development of democracy, growth of the West, slavery and sectionalism, the Civil War, Reconstruction, the making of modern America, industrialization, imperialism, and other topics. *Cr* 3.

Hy 3a/4a. United States History—The origin and development of American institutions from colonization to the present. Institutional models (e.g.—the family, business, education, etc.) will be presented and their development traced to 1900 in the first semester and to the present in the second semester. *Cr* 3.

Hy 5. 6. History of Western Europe—Europe and its civilization from the decline of the Roman Empire to the present. Emphasis on the development of those political, economic, and social institutions that help to explain our present-day civilization. *Cr* 3. COLE

Hy 10. History of Maine — A survey of Maine's social, economic, and political life from primitive times to the present. After a brief study of Indian life preceding white settlement, the periods of colonial, provincial, and state history are covered. *Cr* 3. JORDAN

Hy 101. 102. Ancient History—The political, social, and economic history of the civilizations of the ancient Mediterranean world. Egypt, the Near East, and Greece will be studied in the first semester; Rome will be covered in the second semester. *Cr* 3. DUCLOS, GOODELL

[***Hy 103. 104. The Middle Ages***]—Europe from late antiquity through the Renaissance Special emphasis on the Carolingian Empire, the origin, development and structure of feudalism, the medieval church and state, medieval theology and philosophy, and the coming of the Renaissance. Prerequisite: Hy 5 or permission. *Cr* 3.

[***Hy 107. The Renaissance and Reformation***]—The political, social, economic and cultural achievements of Europe in the period 1300-1650. The Protestant revolt, the Catholic reform, and the wars of religion will be evaluated. Prerequisite: Hy 5.6 or permission. *Cr* 3.

[***Hy 108. Europe in the 17th Century***] — The major political and intellectual developments of the period will be emphasized. The special histories

of each European state will be subordinated to the general problems of state-building, the growth of capitalism and political absolutism, and the diplomacy and wars of Europe as a whole. Prerequisite: Hy 5.6 or permission. *Cr* 3.

[***Hy 109. Europe in the 18th Century***]—The history of the Continent from 1715 through the Congress of Vienna. Emphasis on the Enlightenment, the Enlightened Despots and the origins of the French Revolution. The impact and spread of French revolutionary thought throughout Europe, and the influence of the personality and military campaigns of Napoleon on the Continent. Prerequisite: Hy 5.6 or permission. *Cr* 3.

[***Hy 110. Europe in the 19th Century***]—The history of the Continent from 1815 through the Franco-Prussian war. Liberalism and nationalism, reaction and revolution, socialism and imperialism. The impact of the unification of Germany and Italy on the politics and diplomacy of the Continent. Prerequisite: Hy 5.6 or permission. *Cr* 3.

Hy 111. 112. Europe Since 1870 — The effect of industrialization, the emergence of the masses, the rise and fall of colonial empire and the impact of two world wars. Irrationalist philosophies on the creation of fascism and communism, the recasting of democracy, the development of the European state system and the economic integration of the continent. Prerequisite: Hy 5.6 or permission. *Cr* 3. ALBEE

Hy 115. 116. East Asian Civilizations—Selected topics in the development of Chinese, Korean, and Japanese societies from earliest times to today. *Cr* 3. DIETRICH

[***Hy 121. 122. History of France***]—A survey of French history treating the political, social, economic, and cultural development of the nation. The first semester will span the period from the formation of the French monarchy through the French Revolution and Napoleon. The second semester will cover the period 1815 to the present. Prerequisite: Hy 5.6 or permission. *Cr* 3.

Hy 123. 124. History of Russia—Russian history from the earliest times to the present. The first semester will treat the political, social, economic, and intellectual development of Tsarist Russia to the end of the Napoleonic Wars. Second semester, 19th century Russia, the decay of the Tsardom, the Bolshevik Revolution, and the subsequent internal development and expansion of the Soviet Union. Prerequisite: Hy 5.6 or permission. *Cr* 3. ALBEE

[***Hy 129. 130. Economic History of Europe***]—The economic history of Western Europe in the medieval and modern periods. Agriculture, feudalism, towns and guilds, mercantilism, capitalism, and industrialism. Prerequisite: Hy 5.6 or permission. *Cr* 3.

[***Hy 131. 132. Germany Since 1648***]—The rise of Prussia, the unification of Germany, the Weimar era, the National Socialist period, and the Bonn Republic. Stress is given to political, economic, and intellectual developments. Prerequisite: Hy 6 or permission. *Cr* 3.

[***Hy 133. 134. European Diplomatic History***]—A survey of the diplomatic history of modern Europe emphasizing the national foreign policies of the major European powers and changing concepts of international relations. Prerequisite: Hy 6 or permission. *Cr* 3.

[***Hy 135. 136. History of China***] — First semester: the development of Chinese ideas, institutions, and technology from neolithic times until the eve of

Western expansion into Asia. Second semester: aspects of China's adjustment to the modern world up to the mid-1960's. Prerequisite: Hy 115.116 or permission. *Cr* 3.

[***Hy 137. History of Modern Japan***]—The history of Japan during the past century, with major focus on the Western penetration, the influence of Western ideas on traditional Japanese culture, the emergence of the modern Japanese industrial state, and the rise and defeat of the Japanese empire. Prerequisite: Hy 115.116 or six hours of history, or permission. *Cr* 3.

[***Hy 138. Problems of Southeast Asia***]—An analysis of European imperialist rivalries in the area together with a consideration of the special problems of the new nations recently emerged from colonialism. The background of the French and the American presence in Vietnam will also be treated. Prerequisite: Hy 115.116 or six hours of history, or permission. *Cr* 3.

[***Hy 139. 140. The Middle East***]—The Middle East in modern times, with special emphasis on the impact of the West in terms of political, economic, and cultural change. Prerequisite: six hours of history. *Cr* 2.

[***Hy 141. 142. The British Commonwealth***] — A survey of the modern British Commonwealth. First semester: the history, contemporary position, and problems of Canada, the West Indies and British Africa. Second semester: the Commonwealth countries in Asia and the Pacific. Prerequisite: Hy 5. 6 or Hy. 155. 156. *Cr* 3.

Hy 147. 148. Hispanic America—The Spanish and Portuguese colonial empires in America from their establishment to their achievement of independence in the early 19th century. Second semester: the national period of Hispanic America and an analysis of the contemporary problems and tensions of the area. Prerequisite: No freshmen. *Cr* 3. CONNICK

[***Hy 149. Argentina, Brazil, and Chile***]—A history of the major countries of South America from their independence in 1823 to the present. Primary emphasis on their social structures, political developments, and international relations. Perrequisite: Hy 148 or permission. *Cr* 3.

[***Hy 150. Mexico***]—A history of Mexico from early times to the present. Emphasis on the social and political structure of Mexico, the Mexican wars of independence, and the revolutionary movements of the 20th century. Prerequisite: Hy 148 or permission. *Cr* 3.

[***Hy 151. Latin America and the United States***] — A survey of United States participation in Latin American affairs from the recognition of independence and the enunciation of the Monroe Doctrine to the Good Neighbor policy and the present day. Prerequisite: six hours of history. *Cr* 3.

[***Hy 152. Problems of Latin America***] — An analysis and evaluation of contemporary Latin American problems. The internal tensions and international relations of the several countries. The rise, spread and development of Castroism in the area. Prerequisite: six hours of history or permission. *Cr* 3.

Hy 155. 156. History of England—A general survey of the political, social, economic, and constitutional aspects of English history. Special attention to trial by jury, the evolution of Parliament, the Protestant revolt, the commercial and industrial revolutions, and the growth of political and economic democracy. Prerequisite: Hy 5.6 or six hours of history. *Cr* 3. ALBION

[***Hy 159. 160. History of Canada***] — Canada's history from the earliest settlements in New France to the present. Emphasis on the evolution of Canada

within the British Empire-Commonwealth, relations with the United States, and on the background of contemporary constitutional, economic and cultural problems. Prerequisite: Hy 3.4, 3a/4a or Hy 5.6, or sophomore standing, or permission. *Cr* 3.

Hy 161. American Colonial History—Half the semester is devoted to discovery, exploration and colonization. New Spain, New France, New Netherland and New Sweden are compared with the English settlements (13 colonies), each of which is considered in detail. Second half semester emphasizes social and intellectual topics (e.g.—religion, law, medicine, painting, literature, and music). Prerequisite: Hy 3.4 or 3a/4a or permission. *Cr* 3. CANNON

Hy 162. The American Revolution — The Anglo-French conflict, the series of inter-colonial wars, and the "Old Imperial System" are considered as background to the American Revolution. Subsequently, the period 1763-1789 is treated in detail, including leading personalities, military campaigns, social aspects of the war, and the Constitution (origins, constitutional convention and ratification). Historiography of the period is emphasized. Prerequisite: Hy 3.4 or 3a/4a or permission. *Cr* 3. CANNON

[***Hy 165. Hamilton and Jefferson***]—Special emphasis on Hamilton and Jefferson to include: biographical information, the Jefferson-Hamilton political dichotomy, and its subsequent influence. Following this, a general analysis of social, intellectual, political, economic and diplomatic problems facing the "New Nation" between 1789-1815 is presented. Prerequisite: Hy 3.4 or 3a/4a or permission. *Cr* 3.

[***Hy 166. The Age of Jackson, 1815-1850***]—A consideration of American political, cultural, social and economic development in the first half of the 19th century. Specific topics will include the controversies surrounding Jacksonian democracy, the Bank of the United States, internal improvements, the tariff, "Manifest Destiny," and the sectional-slavery issue. Prerequisite: Hy 3 or 3a or permission. *Cr* 3.

Hy 167. Civil War and Reconstruction, 1850-1877—The crucial decade of the 1850's, emphasizing the role of the slavery issue in creating sectional anxieties and hostilities and undermining the American political system; secession and the coming of war; the military, political, diplomatic and economic aspects of the Civil War and the challenges and ultimate failure of reconstruction in the post-bellum period. The role played by Abraham Lincoln in the Civil War era will receive particular attention. Prerequisite: Hy 3, 3a or permission. *Cr* 3. HUNT

[***Hy 168. The Gilded Age in America, 1877-1914***]—The United States in the age of enterprise with emphasis on the development of political and economic radicalism, the commercialization of agriculture, the rise of the American city, new directions in social thought, concentration of industrial wealth and financial power, and American foreign policy. Prerequisite: Hy 4, 4a or permission. *Cr* 3.

Hy 169. Early 20th Century America, 1900-1938—The Spanish-American War and the new imperialism, the progressive movement and the Wilsonian reforms, and America's entry into World War I will be treated. So too will be the return to isolationism, the "Roaring Twenties," the origin and dilemmas of the Great Depression, and the coming of the New Deal. Prerequisite: Hy 4, 4a or permission. *Cr* 3. CONNICK

Hy 170. America Since 1938—An analysis of FDR and the New Deal, together with a consideration of America's road to Pearl Harbor, World War II, the Cold War, the Fair Deal, the New Frontier, and the Great Society. Special attention will also be paid to the problems of an affluent society and to the civil rights movement of the 1960's. Prerequisite: Hy 4, 4a or permission. *Cr* 3.

CONNICK

[***Hy 171. 172. Economic History of the United States***]—From the colonial period to the present with special attention to the problems raised by the economic evolution of the nation. Prerequisite: Hy 3.4 or 3a/4a or permission. *Cr* 3.

Hy 173. 174. American Diplomatic History—American diplomatic history from the revolution to the present with emphasis on the formation and application of America's major foreign policies. Prerequisite: Hy 3.4, 3a/4a or permission. *Cr* 3.

PEIRCE

Hy 175. 176. American Social and Intellectual History—Social and cultural developments as reflected in philosophy, literature, religion, science, politics, and economics. Prerequisite: Hy 3.4, 3a/4a or permission. *Cr* 3.

[***Hy 178. History of the American Frontier***]—The frontier is approached conceptually through a detailed study of the Turner thesis, the historiographical controversy, the study of historical geography, and the frontier as symbol and myth. Two "case histories" are presented as in-depth examples of the frontier experience: first, the Northern Colonial Frontier, and second, the Far Western Frontier. Prerequisite: Hy 3.4, 3a/4a or permission. *Cr* 3.

[***Hy 182. Naval History***]—The influence of sea power on history with major emphasis on the Anglo-American naval tradition since 1750. Naval strategy, tactics, operations and administration will be evaluated during the period of naval growth (1775-1900) and in the subsequent era of the battleship and the fast carrier attack force. Anglo-American naval operations in World War I, World War II, Korea and Vietnam will be specially considered. Prerequisite: Hy 3.4, 3a/4a, or permission. *Cr* 3.

[***Hy 183. Maritime History***]—Ships and trade from colonial days to the present. Emphasis on famous ships and ship builders, the evolution of ships from sail and wood to steam and steel, the effect of the Civil War and two world wars on the American merchant marine, and the relationship between the United States Navy and the merchant service. Prerequisite: Hy 3.4, 3a/4a or permission. *Cr* 3.

Hy 186. Urban History of the United States—An evaluation of special topics in the rise of the city in America and the development of urban patterns of life. Attention will focus on such subjects as the population shift to the cities, the development of slums and ghettos, the growth of municipal institutions and services, and the relationship of government with city dwellers. Prerequisite: Hy 3.4, 3a/4a or permission. *Cr* 3.

WHITMORE

[***Hy 188. History of the South***]—Studies in selected aspects of the economic, political, and cultural life of the region. Emphasis given to the problems of slavery and race, economic development and stagnation, the relationship of sectional politics to national politics, and the myth and reality of Southern culture and literature. Prerequisite: Hy 3.4, 3a/4a or permission. *Cr* 3.

Hy 189. The Negro in American History—The experience of black people within American society from the colonial era to the present will be treated through their interaction with the nation's social, political, cultural, and economic institutions. Major topics will include the African heritage, components of slavery,

abolitionism, segregation, programs of race advancement, and the modern search for identity. *Cr* 3. WHITMORE

Hy 190. Seminar in Methodology in Selected Areas of the Social Sciences—A one-semester course to introduce students to the library and community resources available to, and used by, social scientists. Course will emphasize student research and writing. Prerequisite: six hours of history. *Cr* 3. CONNICK

Hy 198. Selected Topics in History—An analysis in depth of a selected controversial historical problem. The topic to be studied and the method of approaching it will be chosen jointly by interested students and the staff. Prerequisite: permission. *Cr* 3.

[***Hy 199. Problems in Contemporary History***—An analysis in depth of a selected controversial and contemporary historical problem. The topic to be studied and the method of approaching it will be chosen jointly by interested students and the staff. Prerequisite: permission. *Cr* 3.

[***Hy 240. Recent Literature in European History***]—A survey of the most important recent literature in the field of European history. Designed to inform the public school teacher and advanced undergraduate of the newest publications and historical controversies. Annotated bibliographies will be prepared. Emphasis on reading and discussing books and articles with applicability to secondary education programs. Prerequisite: Hy 5.6 and six hours of European history or permission. *Cr* 3.

[***Hy 280. Recent Literature in United States History***]—A survey of the most important recent literature in the field of U.S. history. Designed to inform the public school teacher and advanced undergraduate of the newest publications and historical controversies. Annotated bibliographies will be prepared. Emphasis on reading and discussing books and articles with applicability to secondary education programs. Prerequisite: Hy 3 4, 3a/4a and six hours of U.S. history or permission. *Cr* 3.

PHYSICAL EDUCATION

ASSOCIATE PROFESSOR SULLIVAN (DISCIPLINE REPRESENTATIVE); ASSISTANT PROFESSORS STURGEON, FOLSOM, WILLARD; INSTRUCTORS CHAREST, MARTIN.

Physical Education for Women (Required Program)

The required program is concerned with encouraging the pursuit of exercise as a pleasurable and healthy habit and instilling appreciation, respect, and love for participation in activity.

To fulfill the physical education requirement, students may elect two of three areas. The areas are designated as: 1) Individual and dual or team sports; 2) Dance; 3) Fitness or gymnastics. When the area requirements are satisfied, the student is free to select any activity with the stipulation that it not be a repeat activity. Within each area there is a variety of different activities for which the student may register. This allows the student to choose the activities in which she has an interest and would enjoy.

Physical Education for Men (Required Program)

The required physical education program for freshman men is designed to establish regular habits of physical activity, to teach basic motor skills, and provide

an exposure to a variety of recreational activities that may be enjoyed in later life. The program takes into consideration the needs of each individual and allows a choice of physical activity to satisfy such needs and the capabilities of each student.

Pe 1. Foundations of Physical Education (Men and women) — The "know why" of exercise, along with basic physical conditioning and activity skills. Enables the student to demonstrate to himself, through participating in a battery of tests, the improved physical status he may expect from a vigorous training program. Also incorporates such related health knowledge as pertains to weight control, relaxation, body mechanics, total fitness and the dangers of sedentary living. Two hours a week. No credit.

Pe 2. Physical Education Activities (Men and women)—Basic instruction in several carryover sports and activities. Based on the student's individual needs and interests, activities may be selected from the following: circuit training, beginning swimming, volleyball, badminton, handball, squash, bowling, golf, archery, skiing, sailing, softball and tennis. Two hours a week. No credit.

Professional Courses For Men

The professional courses in physical education are designed for students who have a desire to qualify as physical educators, coach athletic teams, and direct recreational programs. Sound health, outstanding character, proficiency in motor skills, and an alert mind are requirements for admission.

All professional physical education courses offered at the Portland campus of the University of Maine may be transferred for credit to the Orono campus and applied toward a major in physical education. The Portland campus does not offer a major in physical education at present; however, students completing the program of courses listed will be adequately prepared to enter the coaching field upon graduation.

Pe 9m. Team Sports Skills—To develop skills, techniques, and understandings for competency in basketball, football, and volleyball. *Cr* 1.

Pe 10m. Sport Skills—To develop skills, techniques, and understandings for competency in baseball, track, and tennis. *Cr* 1.

Pe 11m. Fundamental Physical Education Skills—To develop skills, techniques, and understandings for competency in soccer and wrestling. *Cr* 1.

Pe 12m. Fundamental Physical Education Skills — To develop skills, techniques, and understandings for competency in golf, archery, badmintion, fencing, handball, squash, and tennis. *Cr* 1.

Pe 13m. Physical Conditioning—To develop skills, techniques, and understanding for competency in mass exercise, floor work, and body development.

Pe 63m. Coaching Techniques—Practical instruction in football and basketball for men preparing to enter the coaching profession. *Cr* 2.

Pe 64m. Coaching Techniques—Devoted to a study of the mechanics of running, jumping, and weight throwing, with discussions of different styles involved in track and field activities; also a study of approved methods in coaching baseball in all of its phases. *Cr* 2.

Pe 65m. Coaching Techniques — Practical instruction in wrestling and soccer for men preparing to enter the coaching profession. *Cr* 2.

Pe 73. Athletic Training—Prevention and care of injuries in athletic activities; the use of proper personal and field equipment, support methods, conditioning exercises, the medical examination, and therapeutic aids. *Cr* 2.

Pe 1W, 2W. Physical Education—Activities are chosen from two of the following areas: 1) Team sports (basketball, field hockey, volley ball) and/or individual sports (archery, badminton, golf, skiing, tennis); 2) Fundamentals of gymnastics or fitness; 3) Dance (modern or folk). Two hours a week.

* Additional courses in the Physical Education professional program will be offered periodically.

POLITICAL SCIENCE

ASSOCIATE PROFESSOR PEASE (LEAVE OF ABSENCE); ASSISTANT PROFESSORS FISHER, HINMAN, PEIRCE (DISCIPLINE REPRESENTATIVE), ROBERTS.

Courses in political science provide students with a knowledge of the theory, function, and problems of government and politics at local, state, and national levels. Students may compete for a Congressional Intership Program in Washington, D.C., and a State Government Internship for Maine. Students should consult with their advisers for further information concerning these programs. The political science discipline, in cooperation with the Continuing Education Division, is developing a program leading to the master's degree in public administration.

Students majoring in political science must complete a minimum of 36 hours in the discipline, including:

a) Pol 1/2 Introduction to Government

b) Pol 183/184 Constitutional Law *or*

Pol 189.190 Political and Social Thought

c) Pol 197 Scope of Political Science (senior year)

Note: Pol 21.22, Current World Problems, may not be counted towards major requirements.

In addition, political science majors must complete 18 hours in related areas, choosing one of the following options:

a) General: any three of the following full-year courses:
Ay 1/2, Ec 1/2, Hy 3.4, Hy 5.6, Pl 1.2, Sy 3/4.

b) Specific: 18 hours, including a six-hour foundation course in one of the following fields: Economics, history, psychology, or sociology and anthropology.

Course Offerings in Political Science:

Pol 1/2. Introduction to Government—An introduction to the discipline of political science, with emphasis on U.S. government and politics. Political systems, cultures, and ideologies. Political institutions, processes and problems in the U.S. *Cr* 3.

Pol 21. 22. Current World Problems—Contemporary domestic and international affairs, with special emphasis on events in the Communist world and the under-developed areas. *Cr* 2. ROBERTS

Pol 133. The American City—The process of government in urban America including concepts of local self-government, forms and procedures in urban governing, and developments in intergovernmental relations and metropolitan areas. Prerequisite: Pol 1/2. *Cr* 3. FISHER

Pol 135. Democratic Governments of Europe—An introduction to the parliamentary system, through a study of the governmental operations and politics of Britain, France, and the Federal Republic of Germany. Other topics covered: the Common Market and prospects for European integration; relationship of democratic Europe with Communist Europe. *Cr.* 3. ROBERTS

Pol 136. The Soviet Union—An introduction to the USSR. Russian and Soviet political history; Marxism-Leninism; the party and state structures; the socialist economy; impact of the regime on the individual Soviet citizen; cultural life. *Cr* 3. ROBERTS

Pol 139. Soviet Foreign Policy—A survey of Soviet foreign policy as a continuation of Tsarist policies; as a world movement; the Comintern and the Popular Front. Impact of World War II: the emergence of the USSR as a superpower. Post-Stalin modifications. Case studies in contemporary foreign problems, including relations within the Communist world. *Cr* 3. ROBERTS

[***Pol 156. Political Parties***]—Development and present organization and operation of the American party system. Nature and function of major and minor parties, sectionalism, nominating systems, presidential and congressional elections, the electorate, finance, interest groups. Prerequisite: Pol 1/2. *Cr* 3. HINMAN

[***Pol 157. The President and Congress***]—A detailed analysis of the executive and the legislature, their processes, roles, behavior, and leaders; contemporary legislative-executive relationship. *Cr* 3. HINMAN

Pol 173. 174. International Relations — First semester: the nation-state system, techniques of states in expanding their influence, and restraints imposed on their freedom of action. Second semester: a comparative analysis of the actions of major governments of the world through the study of the implementation of policy in specific areas. *Cr* 3. PEIRCE

Pol 183/184. American Constitutional Law—The development and interpretation of the American Constitution through Supreme Court decisions. First semester: the nature of the federal judicial process, interstate commerce, taxation, war powers, federal-state relations. Second semester: the Supreme Court and civil rights. Prerequisite: Pol 1/2 or permission. *Cr* 3. HINMAN

[***Pol 187. International Law***]—An analysis from the political perspective of the sources, limitations and institutions of international law in the search for effective legal standards to achieve world order. Alternate years beginning 1970-71. *Cr* 3. PEIRCE

[***Pol 188. International Organization***]—An analysis of the approaches to the problems of peace, economic and social justice at the international level. Emphasis on the United Nations system and its specialized agencies. Spring semesters alternate years beginning 1970-71. *Cr* 3. PEIRCE

[***Pol 189. 190. Political and Social Thought***] — A survey of political theories from ancient Greece to recent times. The basic approach is historical, and seeks to relate theories of politics to the environments in which they developed. Prerequisite: junior or senior standing. *Cr* 3. FISHER

Pol 193. Special Topics in Political Science—A concentrated program of readings on a particular subject of the student's selection. The readings will be

chosen with the advice and under the direction of a faculty member. Admission by permission of the political science faculty. *Cr* 3.

Pol 197. Scope of Political Science—The scope and nature of the study of politics: power and society; basic descriptive political theory and the role of political institutions. Prerequisite: Pol 1/2. Open to senior political science majors or with permission. *Cr* 3. FISHER

Sem 5. The Supreme Court and Public Education—Contempoary educational topics such as integration, religion in the schools, federal aid to education, student unrest, student and teacher rights as seen through court decisions and other readings. *Cr* 3. HINMAN

SOCIOLOGY AND SOCIAL WELFARE

PROFESSOR ROMANYSHYN; ASSOCIATE PROFESSORS PAULHE, MONSEN; ASSISTANT PROFESSORS GIGUERE, STEINMAN; INSTRUCTOR WATERHOUSE

The world, unlike University disciplines, is not neatly divided into discrete categories. The sociology program informs itself from this idea. The discipline conceptualizes the world of men as a totality of interdependent elements dynamically operating. Contemporary social problems—which is our major concern—will be examined in this light.

These problems, despite their complexity, will be viewed as explicable and capable of resolution when they are approached from a creatively-imaginative sociological perspective. Wars, revolutions, and assassinations do not "just happen": one can analyze social events and detect connected causative threads. The student of sociology, no matter what his career objective, will be encouraged to thrust himself into the apparent chaos of the social flux and attempt to find these "threads." Hopefully, he will, in the process, become a truly educated man capable of functioning on high level within the apparent ambiguities of society.

There is a major program here in sociology and students majoring in it who intend a career in this field will be given ample exposure to the "tools of the trade" which will prepare them for graduate school. The sociology major is required to take Ay 1/2, Introduction to Anthropology; Sy 119, Statistical Methods for Sociological Research; Sy 120, Methods of Social Research; and Sy 160, Sociological Theory; as well as Sy 3/4, Introduction to Sociology. The latter course is a prerequisite for all upper division courses.

Students completing a major in sociology will have many interesting occupational choices open to them after graduate school. Graduate work will be necessary, of course, to obtain the more attractive jobs available to sociology majors. College teaching and social research jobs in industry and government abound for those who go on to complete the Ph.D. in sociology; however, the achievement of a master's degree can qualify the student for many interesting, socially useful and financially rewarding jobs.

Students have the option of concentrating in a social welfare sequence within the sociology major. Social welfare is an interdisciplinary area of study. Although it draws heavily from sociology, it derives its knowledge also from history, economics, political science, psychology, and philosophy. The goal is to enable students to understand and critically evaluate the effort of society to deal with its social problems and to improve the quality of life. Socially recognized needs, formal organizations (social agencies), human service professions, and the de-

velopment of social policy within the context of democratic values and changing social order represent key concepts. Study of social welfare is both liberal and pre-professional education. Courses are intended for the general student and for those who wish to prepare for a career in one of the human services.

Also within the discipline is anthropology. The current offering in Ay 1/2, Introductory Anthropology, explores some of the major areas and theories in this field. Although similar to sociology in the common concern with culture, one chief difference is in the attention paid to those biological features which enable man to create a distinctively human world. In addition to such ethnographical matters as custom and social organization, consideration is given to human paleontology and racial formations. Consequently, students specializing in related areas of social sciences will find this study quite valuable. It is expected that in the near future more courses in anthropology will be offered.

Sociology

Sy 3/4. Introduction to Sociology—The fundamental concepts, principles, and methods of sociology; analyzes the influence of social and cultural factors upon human behavior; evaluates effect of group processes, social classes, stratification, and basic institutions on contemporary society. The first semester (Sy 3) concentrates on concepts and principles; the second semester (Sy 4) on application of these to various social problem areas. *Cr* 3.

Sy 110. Social Organization—An examination of selected institutions in modern society, analysis of social roles, processes and structures within typical organized groups, such as industrial, military, religious and fraternal organizations; discussion of bureaucracy, decision making, social conflict; the implication of cultural and technological change. Prerequisite: Sy 3 or permission of instructor. *Cr* 3.

Sy 113. Social Disorganization—The origins and causes of socially disapproved behavior. Ways in which society interprets and copes with the deviant. Study of the major forms of social disorganization; specific social problems are considered, such as suicide, crime, drug addiction, alcoholism, prostitution, mental illness, divorce, group conflict. Prerequisite: Sy 3 or permission of the instructor. *Cr* 3.

Sy 114. Social Change—Analysis of sociocultural factors related to social change and the dynamics of the change process. Sy 3 or permission of the instructor. *Cr* 3.

Sy 118. Sociology of the Family—A sociological approach to the study of the family, including the structure of social relationships, the modern American family as a social institution, the cultural background of the family, and the impact of social change. Prerequisite: Sy 3 or permission of the instructor. *Cr* 3.

GIGUERE

Sy 119. Methods of Social Research—Nature of scientific research; relationship of research to theory; design of social research; sampling, observation and measurement problems; descriptive statistical techniques; correlation. *Cr* 3.

PAULHE

Sy 120. Methods of Social Research—Research design; data collection; multivariat analysis; hypothesis testing; scaling and inference; parametric and non-parametric statistical tests. *Cr* 3. PAULHE

[***Sy 122. Criminology: The Adult Offender***]—Social and cultural factors in the causation of crime among adults; organized crime as a social phenomenon in

American life; specific types of criminal careers; legal and judicial aspects of crime. Prerequisite: Sy 3, or permission of instructor. *Cr* 3.

Sy 123. Social Stratification — Systematic analysis of social differentiation and evaluation. Theories of, and research in, the structure and function of class, caste, and ethnic stratification. Prerequisite: Sy 3, or permission of instructor. *Cr* 3. GIGUERE

[***Sy 125. Industrial Sociology***]—Social factors involved in the development of industries; social consequences of technological change; social organization within industry; problems encountered within the social structure(s) of industry. Prerequisite: Sy 3, or permission of instructor. *Cr* 3.

[***Sy 126. Sociology of Urban Life***]—A descriptive and analytical approach to the study of city life. Emphasis is placed on environment, social organization, the ecological processes, population, areas, housing, and maladjustments. No freshmen. Prerequisite: Sy 3, or permission of the instructor. *Cr* 3. GIGUERE

[***Sy 134. Population***] — Theories of population. Demography; analysis of birth, death, and migration trends. Problems and policies. Prerequisite: Sy 3/4 or permission of instructor. *Cr* 3. GIGUERE

[***Sy 140. Social Control***]—Examination and comparison of major societal control mechanisms. Emphasis on various institutions of social control and their role in establishing and maintaining social order. Prerequisite: Sy 3, or permission of instructor. *Cr* 3.

Sy 160. Sociological Theory—A critical examination of the sociological theories of Marx, Max Weber, Durkheim, and contemporary theorists such as Parsons and Robert Merton. Study of developments in sociological theory as related to methodology, social issues, and current trends in contemporary sociology. Prerequisite: Sy 3 and two other courses in sociology, or permission of the instructor. *Cr* 3.

[***Sy 161. History of Sociology***]—Trends and leading figures in the history of sociology. Survey of current approaches and established principles in the field. Prerequisite: Sy 3 and two other courses in sociology, or permission. Seniors only. *Cr* 3.

[***Sy 169. Collective Behavior and Social Movements***]—Behavior of groupings such as mobs, crowds, and riots. Relatively unstructured mass behavior and broad society-wide movements are analyzed. Prerequisite: Sy 3, or permission of the instructor. *Cr* 2.

[***Sy 171. Sociology of Medicine***]—Attention is given to the relationship between sociocultural factors and the occurrence of disease and the social systems which are developed in the treatment and prevention thereof. Prerequisite: Sy 3/4, or permission of the instructor. *Cr* 3.

Sy 197/198. Department Projects—For the advanced student. Minimum of 15 hours of department courses as a prerequisite: Apply directly to discipline representative. *Cr* 2 or 3.

Social Welfare

Sw 150. Social Problems and Social Welfare Policy—A critical examination of how society defines its social problems and develops strategies for dealing with them. Social welfare policy and programs are studied within a social and cultural context. Prerequisite: Ay 1/2 or Sy 3. *Cr* 3.

Sw 152/153. Human Service Organizations and Professions — Guides the student toward developing a rational perspective on those occupations in service to man, and the bureaucracies which deliver their services. Consideration is given to the interaction between professionals and their clients, as well as to the new emphasis upon the assumption of policy-making roles by clients. Prerequisites: Sy 3 and Sw 150 or permission of the instructor. *Cr* 3.

Sw 154/155. Field Experience in Social Welfare — Conceiving of the community as a laboratory, students engage in field experience to apply knowledge from the social and behavioral sciences in order to deepen their understanding of concepts and test their motivation and capacity for human service. Prerequisites: Sw 150, Sw 152 or permission of the instructor. *Cr* 3.

Sw 154 A. Field Experience—Human Service Professions—A field experience course designed to provide the teacher candidate with experiences which will increase his awareness and understanding of the roles of other human service professionals in community dynamics; an opportunity to use the community as an extended university laboratory for testing application of theoretical formulations drawn from specific social and behavioral studies—especially those relevant to urban or disadvantaged school children. This course requires two full days, or the equivalent, each week for eight weeks. In most cases, class seminars, class meetings in the community, and individual agency internships will be held on Mondays and Wednesdays.

THE HONORS PROGRAM

H. Draper Hunt, Secretary

Normally, an incoming freshman will be invited to join the Honors Program on the basis of his intellectual curiosity and initiative as displayed in his high school work, as well as on the basis of his C.E.E.B. test scores. Already enrolled students who have demonstrated marked intellectual curiosity and ability and have maintained a point average of 3.0 or better will be invited to join the program as second-semester freshmen or sophomores. Some few exceptionally qualified juniors may be admitted to the program.

To be considered a member of the Honors Program, a student must successfully complete (with a grade of B or higher) a minimum of four semesters of Honors works, including both semesters of the senior year (Hr 53 and 54) and at least one semester of sophomore group tutorials (Hr 47 or 48). A student who has successfully completed the Honors Program will be awarded his degree with honors, in one of three categories: Honors, High Honors, Highest Honors, depending upon three factors: the quality of the student's senior thesis or research project; his performance on the comprehensive oral examination; and his accumulative average over seven semesters.

The promising student will find in the special independent study program, as well, flexibility and encouragement for his intellectual curiosity.

Early independent study allows a qualified freshman or sophomore to substitute projects carried out under the guidance of professors in appropriate disciplines, in the place of some general, normally required courses.

Freshman Year: Hr 41—Distinguished Freshman Seminar. Discussions and demonstrations displaying the range and nature of the liberal arts and sciences. Offered in the fall semester. Limited to selected freshmen, 3 credits. *Hr 45*—Honors Colloquium. Readings and discussion on the basic concepts of Western civilization. Offered in the spring semester. Limited to selected freshman. Three credits.

Sophomore Year: Hr 47 and 48—Honors Group Tutorial. Oral and written reports under tutorial direction. The student is expected to read widely in areas outside his normal course program and particular field of interest. The books are selected from an honors reading list, and each group tutorial does substantial reading in three or four areas of thought each semester. Open to sophomores and those students admitted to the Honors Program at the beginning of the junior year. Three credits each semester.

Junior Year: Hr 51 and 52—Honors: Specialized Studies. Individual tutorial work in the student's major field. The student will read both in depth and breadth in his chosen area of concentration under faculty guidance, and will select an approved thesis topic by the end of the course. Open to juniors. Three credits each semester.

Senior Year: Hr 53 and 54—Honors Thesis. The planning and completion of an honors thesis or research topic. The student will work closely with his faculty tutor and should expect to submit his thesis by May 1. This will be followed by a comprehensive oral examination before a faculty board, in which a student demonstrates both breadth of knowledge and depth of specialization within his major field. Open to seniors. Three credits each semester.